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BUREAU OF HYGIENE AND TROPICAL DISEASES.

TROPICAL DISEASES BULLETIN.

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SUMMARY OF RECENT ABSTRACTS*

I. CHOLERA.

Epidemiology.

In Bengal, LAL (p. 717) shows that endemic regions of cholera lie chiefly along the lower reaches of the river Hooghly and that in the non-endemic regions there is only a low degree of epidemic visitation; the trend of cholera mortality appears to be declining in many areas. Little support was found for the theory that a critical level of absolute humidity is a determining factor in the forecasting of epidemics.

Aetiology.

SEAL (p. 278) has found advantage in a bismuth-sulphite medium (of which details are given) over alkaline peptone water for the isolation of *V. cholerae*.

LAHIRI *et al.* (p. 718) have tested the viability of true cholera vibrios in natural waters, using for the purpose freshly isolated vibrios of the Inaba type. The results varied, according to the source of the water, from one hour up to 18 days, and the vibrios lived longer in autoclaved and filtered waters than in raw waters. SOPARKAR (p. 277) found viable *V. cholerae* in only 2 of 60 flies tested up to 4 hours after ingestion, but the vibrios could be isolated from faecal and vomit spots in a large number of cases during the first 8 hours after feeding, and occasionally up to 24 hours.

BAARS (p. 718) has carried further his studies on the breaking down of glucose by the cholera and El Tor vibrios under both aerobic and anaerobic conditions. The El Tor vibrio ferments glucose more energetically than the cholera vibrio.

PASRICHA *et al.* (p. 276) found that 10·7 per cent. of 438 vibrios from cases of cholera were not agglutinated by Inaba O, Ogawa O or Inaba HO sera. In an examination of 219 strains of vibrios from cases of cholera, healthy persons and water, all non-agglutinable by O serum [and therefore not *V. cholerae*], AHUJA and SINGH (p. 277) found that 35·5 per cent. possessed H antigen partly or completely identical with that of *V. cholerae*. VENKATRAMAN (p. 277) shows that, in Madras,

* The information from which this series of summaries has been compiled is given in the abstracts made by the Sectional Editors in the *Tropical Diseases Bulletin*, 1940, Vol. 37. References to the abstracts are given under the names of the authors quoted and the pages on which the abstracts are printed.

none of a series of vibrios isolated from water was agglutinated by O serum of group 1, Gardner and Venkatraman, and also that in Madura city, which had been free from cholera for a year, no vibrios isolated from stools of 6,301 residents were agglutinated by that serum.

GENEVRAY (p. 717) has studied the dissociation of the cholera vibrio in peptone water under the influence of chlorine. The dose of free chlorine in excess was 2·6 mgm. per 10 cc. peptone water, and this was allowed to act for 45 minutes, after which time sub-cultures were made into fresh peptone water. After this process had been repeated three times, colonies on solid media were of two kinds, one dry and wrinkled, the other translucent and smooth like the colonies normally seen. The wrinkled colonies were shown to be those of true *V. cholerae*. He further (p. 717) succeeded in producing similar dissociation by means of phenol, and shows (p. 718) that the wrinkled colonies obtained by both methods were the same. They differed from the smooth colonies in macroscopic characters and in increase of proteolytic, milk-coagulating, haemolytic, haemagglutinating and chlorine-resisting powers. The wrinkled type reverted to the smooth type on repeated subculture, and is therefore a variant and not a mutation.

WHITE (p. 719) has found that the gelatinous intercellular substance, characteristic of cultures of rugose vibrio variants, contains a haptene reacting specifically with whole rugose cultures, and with antisera to certain rugose extracts. He (p. 720) describes the antigenic properties of a heat-labile somatic protein obtained from vibrios. Injection of this protein into animals provokes, in a proportion of cases, the formation of precipitins, and it is thought that the substance has a somatic rather than a flagellar origin.

RAYNAL *et al.* (p. 720) have found that the activity of trichloracetic acid extracts of different strains of *V. cholerae* is directly correlated with the virulence of the strain used, and that strains recently isolated from severe cases of the disease are those best suited to furnish antigens having specific, toxic and antigenic characters. DAMBOVICEANU and BARBER (p. 721) have also worked with a trichloracetic acid extract of *V. cholerae*, which shows toxic, antigenic and allergic characters. They give the biochemical reactions of the extract and conclude that it is a glucosidic lipoid complex containing amino-nitrogen and phosphorus.

Pathology.

SOLARINO (p. 281) has shown experimentally, first, that cholera vibrios can pass through the buccopharyngeal mucous membrane of rabbits and can be transported by the lymphatic and blood stream to the intestine, and second, that the vibrios can withstand the acidity of the gastric juice and can pass on alive through the stomach to the intestine.

CHATTERJEE (p. 278) has found that when *V. cholerae* is grown in synthetic medium, histidine in the medium is completely transformed into histamine, and he draws attention to the fact that changes in tissues and organs of cholera patients resemble those produced by histamine. He (p. 282) contributes a further study on the pathology of cholera. The condition in organs other than the gastro-intestinal tract and lymph glands consists mainly of dilatation of the capillaries. There is bile stasis, probably due to a nervous mechanism. Cholera

shock probably does not depend on dehydration alone, but is also due to this great dilatation of capillaries in various organs. The author suggests that the symptom complex of cholera is the result of an allergic state rather than of toxaemia or acute inflammation. In an editorial in the *Calcutta Medical Journal* it is remarked that specific hypersensitiveness in epidemic diseases is not easy to imagine and that the theory that the symptoms of cholera are explained by the production of histamine in the alimentary canal is more attractive. It is, however, probable that the effects of the vibrio are due to specific toxins elaborated in the intestinal wall.

Treatment and Control.

HIGGINS (p. 282) describes an emergency method of treatment organized in Shanghai during an epidemic in war refugees. This consists of a single massive infusion of normal saline, at a rate of 2 litres an hour, continued until the pulse is reasonably good and until the body temperature rise approaches normal. The patients lie on string cots and defaecate into large pans beneath and no other treatment is given. Reactions are common but are disregarded, and clinical improvement is rapid, with few relapses. The death rate in one emergency hospital was 7 per cent. Diagnosis was made on the presence of painless purging, dehydration, rice-water stools and aphonia.

IDE (p. 723) states that in Japan cholera occurs only as a result of importation from China, where it is epidemic every year. In 1939 no actual cases were imported into Japan, but carriers were. These persons were in apparently good health when admitted, and it was possible to trace them to their destinations. This discovery of carriers, however, led to a new quarantine regulation by which passengers are only allowed to land after the result of stool examination is known, instead of, as previously, on collection of the stool.

Studies on the haemolytic power of vibrios and on the Celebes and El Tor vibrios.

AIDA (p. 719) notes that repeated subculture appears to weaken both the milk-coagulating and the haemolytic power of cholera and cholera-like vibrios [this is not in accordance with the work of DEL FAVERO (this *Bulletin*, 1939, Vol. 36, p. 374) who found that laboratory strains of *V. cholerae* kept for 15 passages at 20°C. became strongly haemolytic].

The haemolytic power of *V. cholerae* is discussed by MERTENS (p. 279) who shows that stringent conditions must be laid down before the test can be regarded as completely valid. With salt concentration of 0·85 per cent., the use of 5 per cent. erythrocytes, and at *p*H 4 to 9, a reading after 2 hours gives safe results, but late haemolysis is given by simple uninoculated bouillon in 8 or 9 days. Unwashed corpuscles resist haemolysis, there are distinct differences in the occurrence of haemolysis at 26°C. and at 37°C., and shaking the vibrios with blood gives better contact and promotes haemolysis. He points out that at room temperature, thick suspensions of 24-hour agar colonies of *V. cholerae* can give haemolysis in 24 hours. Discussing the haemolytic power of the cholera, El Tor and Celebes vibrios, MERTENS and BEEUWKES (p. 721) begin by quoting a finding of Mertens [above] that 24 of 26 very thick suspensions of *V. cholerae* were capable of

causing haemolysis of once-washed erythrocytes of goat's blood. It therefore becomes a matter of importance to determine if haemolytic power in the case of *V. cholerae* is merely a matter of degree of concentration, as it appears to be, and to ensure that in comparisons of this power in the different vibrios uniform standards and methods of testing are applied. The author's findings were as follows: (1) The centrifuged supernatant fluid of thick suspensions of all strains of El Tor, most strains of Celebes, and some strains of cholera was haemolytic and the haemolysin was thermolabile. (2) The precipitate obtained from the supernatant fluid with 96 per cent. acetone alcohol showed no haemolytic character in the case of cholera, little in the case of Celebes and definite haemolytic power in the majority of El Tor strains. When haemolytic power was present it was not altered by heating. (3) Nutrient bouillon sown with vibrios, incubated for one or two days and centrifuged, showed the supernatant-fluid acetone-alcohol precipitate to be non-haemolytic for cholera and both strongly haemolytic and thermolabile for all strains of El Tor and Celebes.

GISPEN (p. 280) discusses the relationship of the cholera, El Tor and Celebes vibrios and concludes that the only two recognized differentiating tests are the haemolysis test and the Voges-Proskauer reaction. He describes, however, a third test: heating suspensions of *V. cholerae* in saline to 56°C. for 3 hours renders the vibrios inagglutinable, but has no such effect on the El Tor and Celebes vibrios, which must be heated to 60°C. before agglutinability is destroyed. In general characters and chemical structure the El Tor vibrio occupies a position intermediate between the cholera vibrio and the non-agglutinable vibrios.

DE MOOR (p. 279) discusses the outbreak of cholera in Celebes, which was caused by an El Tor vibrio belonging to the Gardner and Venkatraman sub-group O 1, to the Heiberg type 1, to the Ogawa serological strain and which was haemolytic to goat cells. The El Tor vibrio has been regarded as non-pathogenic but the author points out that this strain has only weak haemolytic power when freshly isolated, and suggests that in previous instances epidemics may have been caused by the El Tor vibrio, and that it has been, on this account, regarded as the true *V. cholerae*. MARRAS (p. 722) on the other hand regards the El Tor vibrio as a non-pathogenic contaminating organism local to the Hedjaz. He finds that it possesses a non-specific O agglutinogenic group identical with the Inaba vibrio, but whereas the El Tor vibrio gives a positive Voges-Proskauer reaction, the Inaba, Ogawa and Kolle vibrios are negative. Since, in his opinion, the El Tor vibrio is non-pathogenic the author states that it cannot be identical with the Celebes vibrio.

Discussing the Celebes outbreak, DE VOGEL (p. 723) brings out certain points: Examination of 2,264 samples of faeces from different parts of the island during 1938 failed to reveal any vibrios which agglutinated with cholera serum; no El Tor vibrio has ever been isolated outside the regions attacked; after the last case of El Tor cholera at Macassar, in April 1938, no more El Tor vibrios were found although several patients in the regions previously attacked, and suffering from cholera-like disease, were bacteriologically examined.

TAKITA (p. 281) claims to have obtained a powerful and specific exotoxin from haemolytic strains of the El Tor vibrio. This toxin, which is lethal to laboratory animals, differs from the haemolysin although it is produced by haemolytic strains only. Toxoid may be

produced, and has antigenic property. Fresh sera of animals will neutralize the toxin, but this power is lost on heating to 56°C. for 30 minutes; specific immune serum can be heated to 60°C. for 30 minutes without loss of power. *Charles Wilcocks.*

SPRUE AND IDIOPATHIC STEATORRHOEA.

Précis of Abstracts in this Section.

Manson-Bahr (p. 7) discusses the tongue in sprue and the mouth lesions in other conditions and expresses the view that there is no essential observable difference between the glossitis and stomatitis of sprue and those of fully developed, or of so-called larval, pellagra. In cases of sprue treated with nicotinic acid the glossitis subsided in three days but the effect on the intestinal symptoms was more difficult to assess and the megalocytic anaemia was not improved. Nicotinic acid treatment (which should be continued for at least 3 months) is the most satisfactory treatment of sprue glossitis, but riboflavin may be added where angular stomatitis is present.

The main defect in sprue is probably lack of absorption from the small intestine, but of this there is no direct microscopical evidence. Other diseases, such as ulceration of the ileum, give rise to a condition which resembles sprue. As in pernicious anaemia, the intrinsic factor is absent but the clinical course of the disease continues whatever the state of the gastric juice. In sprue complete clinical and haematological recovery frequently takes place. It is claimed that a clinical condition of larval sprue exists, in which the glossitis and stomatitis persist for as much as a year before the disease is fully established. The mouth lesions of pernicious anaemia are similar to those of sprue and the two diseases are closely related; cord lesions have been observed in sprue. Nicotinic acid has been used with success in cord lesions associated with glossitis.

Idiopathic steatorrhoea is distinct from sprue, but the glossitis is amenable to nicotinic acid, though not so completely as that of sprue. Pellagrous dermatitis has been observed in sprue, and there is probably a relative C avitaminosis in sprue.

The conclusion is that there is a common link between these various diseases, and that it may be impossible to make an absolute diagnosis where the clinical picture embraces features of several of them. Since sprue originates only in the tropics, local conditions probably exert some decisive influence. Finally, it is concluded that the glossitis of these conditions is a sign of avitaminosis B_2.

Bennett and Hardwick (p. 7) discuss the results of failure of function of the small intestine, which produces a syndrome of steatorrhoea, tetany and macrocytic anaemia, with stomatitis and pellagrous skin lesions. Various other clinical and biological changes are noted and it is emphasized that sprue may have a very long latent period. Two examples are given of a syndrome indistinguishable from tropical sprue appearing in residents of a non-tropical country. Defective

absorption from the small intestine is the cause of the condition; fat and sugar are not absorbed normally and poor absorption of salts causes tetany and defective ossification; defective absorption of iron and of the extrinsic factors result in anaemia. There is deficiency in vitamins A, B, C, D, E and K or P. Gastro-colic fistula produces similar symptoms.

VEDDER (p. 12) traces the stages of sprue from the fundamental failure of absorption of food from the small intestine. There is failure to absorb fat, sugar, salts and vitamins. He postulates, however, that this failure of absorption is itself due to a functional failure of anterior pituitary secretion precipitated in some individuals by tropical service, but admits that no proof of this has been afforded.

POCK-STEEN (p. 13) suggests that the two main factors in the production of sprue are histamine intoxication and loss of vitamin B_2. He designates the sprue-like diseases incipient sprue, which may go on to prosprue or pseudosprue, either of which may lead to anatomical sprue. Metabolic sprue arises from adrenal insufficiency due to climatic factors, and this leads either to histamine toxicosis or to activation of phosphorylizing ferments which interfere with absorption and lead to prosprue. Histamine toxicosis leads to incipient sprue. Enterogenous sprue may be due to excessive acid production by bacteria leading to incipient sprue, or to prosprue which in turn leads to anatomical sprue.

PASRICHA & LAL (p. 13) confirm older work by their finding that monilia is present in the stools of high proportions of healthy persons and of patients with intestinal diseases other than sprue.

RODRÍGUEZ-MOLINA (p. 14) records the results of blood examination in sprue. The changes vary so widely that nothing of value can be deduced other than what is already known.

AMALFITANO (p. 15) has performed the rhamnose test on a large number of patients with intestinal and other diseases. It was positive in two only, one of whom had sprue and the other pernicious anaemia. He therefore regards it as of great value in the diagnosis of sprue. RODRIGUEZ OLLEROS and HERNÁNDEZ MORALES (p. 15) distinguish between sprue and pernicious anaemia by the fact that neutral red is eliminated more rapidly by the gastric mucosa in sprue. Details of the test, and of the results obtained, are given.

HAND (p. 16) has given an account of the diagnosis and treatment of sprue.

LE ROY and CHERTIN (p. 16) give details of the progress and treatment of a case diagnosed as sprue with extreme pernicious anaemia.

CANOVA (p. 17) records two patients with symptoms suggesting tabes; both were also diagnosed as suffering from sprue, but SCOTT in comment points out that the information given is too scanty for such a diagnosis.

SALVESEN and KOBRO (p. 17) discuss the aetiology of idiopathic steatorrhoea and suggest that the cause of the disease is to be found in the lymphatic apparatus between the intestinal walls and the larger collecting vessels. FAIRLEY points out in comment that in tropical sprue no evidence of lymphatic obstruction or of disease of the lymphatic glands has been found.

RØE (p. 18) describes a case of idiopathic steatorrhoea in a child of 9 years who had never been to the tropics. HUGHES (p. 18) and HANSMAN (p. 18) have both contributed papers on steatorrhoea.

C. W.

i. MANSON-BAHR (P.). **Glossitis and Vitamin-B_2 Complex in Pellagra, Sprue and Allied States.**—*Lancet.* 1940. Sept. 14 & 21. pp. 317–320; 356–360. With 8 coloured illustrations on 1 plate. [68 refs.]

ii. BENNETT (T. Izod) & HARDWICK (C.). **Chronic Jejuno-Ileal Insufficiency. Pathogenesis of Coeliac Disease, Tropical Sprue, and Other Conditions.**—*Ibid.* Sept. 28. pp. 381–384. With 3 figs. [22 refs.]

i. It will be convenient to abstract these papers simultaneously as they deal with similar problems, though the approach is made from different angles.

In the first, attention is drawn to the state of the tongue and mouth in relation to the gastro-intestinal tract. The sore tongue of sprue is well recognized, but a similar condition occurs in other closely related diseases. The known aetiological factors in this group of diseases include lack of nicotinic acid and riboflavin; the former being concerned with glossitis, and the latter probably as shown experimentally by Sebrell & Butler, with *cheilosis* (angular stomatitis), which, though usually observed in pellagra, is seen in other allied diseases. Amongst other factors is the extrinsic factor which has a distribution and stability to heat resembling the PP factor (nicotinic acid).

The glossitis and stomatitis of fully-developed pellagra are characterized by angular stomatitis and changes in the epithelium of the lips as described by Stannus, Enright and others, and recently illustrated by Spies & Cooper. It is acknowledged that it is this feature of the disease which yields most satisfactorily to nicotinic acid therapy. A similar glossitis and stomatitis, in the absence of dermatitis, has been regarded by Stannus and other authorities as an incomplete stage of this disease and has been termed " pellagra fruste " or " larval pellagra." This was recognized by the reviewer in Ceylon in 1912. It is the same sore tongue disease which has been described so many times in this *Bulletin* that the impression is obtained that various observers in the tropics are describing the same appearances in the mouth and tongue of ill-nourished people. It has even been suggested that direct sunlight may produce typical pellagrous dermatitis in these larval cases. It is claimed, too, that larval pellagra may be recognized in English practice in patients with glossitis, of which five examples are quoted; all the patients had some gastro-intestinal disturbance and had been subsisting on a restricted dietary. All reacted satisfactorily to nicotinic acid therapy (150 mgm. daily), but it must be remembered that *all* cases of stomatitis are not necessarily of this nature.

After a prolonged study of sprue glossitis over a period of thirty years, as well as from a series of 500 treated during the last two decades, the author expresses the view that there is no essential observable difference between the glossitis and stomatitis of sprue and those of fully developed or of " larval " pellagra. Angular stomatitis may even supervene in advanced cases of sprue as in pellagra. Oesophageal pain (dysphagia) is common to sprue, pellagra and pernicious anaemia and occurs in about the same proportion of cases. Attention is drawn to certain peculiarities of sprue glossitis which were observed in 77 per cent. of the series. In no case was there severe anaemia when glossitis was acute; this would suggest that the inciting cause of glossitis and of the megalocytic anaemia are not necessarily identical. As in pellagra, so in sprue, analytical study of a large series would seem to

indicate that previous intestinal or generalized infection, such as malaria, predisposes to sprue. As in pernicious anaemia, the specific anti-anaemic factor is absent, and the blood responds effectively to the administration of the extrinsic factor (liver); but, in contradistinction to pernicious anaemia, in many cases of sprue the effects in restoring complete haemopoiesis are lasting.

A consecutive series of 20 European cases of tropical sprue with well-marked glossitis was therefore treated (as in pellagra) with 150–300 mgm. of nicotinic acid daily. It is claimed that the results were satisfactory and the effect upon the tongue was most striking. The glossitis subsided and the taste sense was restored in an average of three days but the effects upon the intestinal symptoms were more difficult to assess. This form of therapy did not seem to have any influence upon the megalocytic anaemia which was subsequently treated by parenteral injections of liver. It would appear to be necessary to continue treatment with nicotinic acid for at least three months. In cases with angular stomatitis, riboflavin (3 mgm. daily) was given in addition. From a comparison with other methods of treatment of sprue glossitis over many years the comparatively recently introduced nicotinic acid treatment gave the most satisfactory results and the stay in hospital was short, averaging 22½ days.

After recounting previous views on the hypothesis that the main symptoms and signs of tropical sprue can be attributed to deficiency, evidence has been adduced that the defect lies in the small intestine. This defect, which is probably lack of absorption from the intestinal mucosa, does not manifest itself, as in pellagra and pernicious anaemia, in any ascertainable microscopical changes. But there are other gross lesions in the small intestine which reproduce a *simulacrum* of the clinical picture of sprue; such as ulceration of the ileum, tuberculous or malignant disease of the mesenteric glands, or gastro-jejuno-colic fistula. The conclusion seems inescapable that in disordered function of the small intestine, notably the ileum, lies the essential lesion of sprue. When, however, the pathology of pernicious anaemia is contrasted with that of tropical sprue, it is found that the intrinsic factor is absent in both diseases, but whereas in the former this is directly associated with achlorhydria or achylia gastrica, in sprue the clinical course of the disease continues the same whether there is achlorhydria, achylia gastrica, or even hyperchlorhydria (from figures compiled from a large series). But in tropical sprue complete clinical and haematological recovery frequently takes place, even when the patient is *in extremis*, and may persist, in the absence of further treatment and irrespective in some instances of the age of the patient. Pushing the analogy with pellagra still further, it is claimed that a clinical condition designated "larval sprue" exists, in which the glossitis and stomatitis persist for months or even a year, prior to supervention of the fully developed syndrome. In logical order the glossitis and stomatitis of pernicious anaemia, which are found in varying degrees in about the same proportion of cases, are on the whole similar to those of the sprue tongue; further, it is argued that the haematological changes in sprue are identical with those of pernicious anaemia and that differences in the blood picture are merely those of degree.

Pernicious anaemia arising in Europeans in the tropics appears to be rare; five cases are quoted. All gave a prior history of intestinal disturbance and the fact elicited was that they occasionally suffered

from a sprue-like steatorrhoea. Though sprue and pernicious anaemia are undoubtedly closely related, attention is drawn to the paucity of records of the latter in tropical natives; indeed some authorities do not admit that the disease exists at all in the tropics. Subacute combined degeneration of the spinal cord in conjunction with pernicious anaemia is regarded by some observers as analogous to similar changes in pellagra, and it has been claimed that these spinal lesions are never observed in sprue. It has, however, been met with on two occasions in this disease in this series and in each it was terminal and fatal. Details of these cases are given.

An analysis is also given of 8 European patients from the tropics with combined degeneration of the cord with glossitis. One of them had been treated with nicotinic acid (300 mgm. daily), which appeared to cure the glossitis and to exert a favourable action on the spinal cord lesions. The main interest in these cases lies in the fact that, on account of the glossitis and aphthous ulceration associated with preliminary and occasional fatty diarrhoea, they had been regarded originally, and subsequently treated, as cases of sprue.

Idiopathic steatorrhoea is undoubtedly a condition quite distinct from sprue, though some confusion has been caused by Thaysen who, rather unfortunately, introduced the term "non-tropical sprue." As in tropical sprue glossitis is a conspicuous feature and is almost as frequent as in that disease, and in three cases studied the appearances resembled those of tropical sprue very closely; they also were amenable to nicotinic acid treatment, though the effects of this, combined with intense parenteral liver therapy, were not by any means as striking as in sprue, and in most the course of the disease was usually progressive in spite of treatment. Glossitis and stomatitis are found also in other forms of anaemia, notably in nutritional megalocytic anaemia, *Diphyllobothrium* anaemia and in the "Plummer-Vinson syndrome"—anaemia, dysphagia and malnutrition in underfed women.

In a group of diseases presenting so many different symptoms, and due to so many different factors, border-line cases are encountered. Thus pellagrous dermatitis has been noted in sprue, just as it has been seen in coeliac disease in children and in idiopathic steatorrhoea in adults. One such case is described, with pellagrous rash on hands, face and genitalia, the patient having suffered from sprue for eighteen years. A remarkable recovery was effected by nicotinic acid therapy alone without addition of liver. Other cases of sprue may develop scurvy with scorbutic purpura, of which two cases are quoted. Probably in the majority of sprue cases there is a relative C avitaminosis. Furthermore and rarely, the clinical picture may embrace features of sprue, pellagra and idiopathic steatorrhoea, so that it may be impossible to make an absolute diagnosis. An illustrative case is given.

In the present state of knowledge it is not possible to envisage the exact manner in which these various syndromes are related, but it is clear that there exists some common connecting link or chain. Tentatively a table has been constructed suggesting the importance of absorption of the various factors and vitamins concerned in the production of the signs and symptoms of the diseases characterized by glossitis. It is difficult to believe that tropical sprue originates in the tropics alone and has such a peculiar distribution, unless local conditions comprise some initial and decisive factor. The slow development of the disease is a further difficulty as it may develop many years

after the subject has left the indigenous area of the disease, and in this respect a parallel may be drawn with idiopathic steatorrhoea which may first reveal itself in adult life as a sequel to coeliac disease in infancy, though even here exceptions occur. It is concluded that glossitis of a similar nature is common to pellagra, sprue, idiopathic steatorrhoea, pernicious anaemia, and the nutritional anaemias and in each instance it is a sign of an avitaminosis B_2 and that, through this feature, the aetiology of these diseases may eventually be rendered more clear (a coloured Plate with eight figures illustrates these various forms of glossitis).

ii. In the second paper Izod Bennett and Hardwick discuss the pathogenesis of coeliac disease, tropical sprue and other conditions and the probability that several clinical features are due to chronic jejuno-ileal sufficiency. Protected above and below by the pylorus and the ileocaecal sphincter, the jejunum and ileum are shut off from many adverse influences which cause disease in more exposed parts of the body. Consequently chronic ulceration and malignant disease are rare below the duodenum. No one appears to have described what happens when there is partial or total failure of the jejunum and ileum to fulfil their normal functions. The clinical syndrome thus produced is a combination of steatorrhoea, tetany, and macrocytic anaemia. Within this definition fall coeliac disease (idiopathic steatorrhoea) and tropical sprue. The tendency, as in Germany and Scandinavia, to group these latter two together is deprecated. But this syndrome is also found in some cases of malignant or cicatrizing diseases of the small intestine, of gastro-colic fistula and of tabes mesenterica. Rickets and deformed bones are common when the syndrome occurs in children. The anaemia at times is hypochromic, or erythroblastic ; stomatitis and sore tongue are common and pellagrous skin lesions may be noted. The fatty diarrhoea is notable, for the fat is fully split. Megacolon, which is perhaps compensatory, may be pronounced ; but when the syndrome commences in childhood and proceeds during adolescence, there is stunting of growth accompanied by infantilism, and, in adult life, sterility. In pregnancy there is often an acute exacerbation of symptoms. Biochemical changes are a sequel : Blood calcium and blood phosphorus are low and usually the glucose-tolerance curve is flattened. Achlorhydria is common, but by no means constant.

Coeliac disease and tropical sprue are therefore two relatively common diseases distinct from one another. The main points are that coeliac disease is a disease of children : tropical sprue of adult life. Megacolon is common in older patients in the former ; rare or hardly known in the latter. Rickets and deformed bones are found in coeliac disease alone. The blood pictures of the two diseases sometimes differ and, whilst established coeliac disease is fatal in 40 per cent., tropical sprue has an extremely good prognosis under modern conditions. Delayed coeliac disease and delayed sprue have several features and analogies in common. In 15 cases of adult coeliac disease (idiopathic steatorrhoea), in one only did the history commence later than childhood. The exceptions to this are rare ; one, a female, is quoted ; the disease commenced at 14 and death was eventually due to fulminating pernicious anaemia. Two cases of delayed onset in tropical sprue are quoted—one, a female, of nine years, with tetany and anaemia in which the results of treatment were most satisfactory ; a second, a man of 55 with a latent period of four years, who responded favourably to nicotinic acid and riboflavin therapy. A third example is quoted where

typical sprue developed thirty-seven years after the patient had left the tropics. One case is recorded in which steatorrhoea commenced suddenly in adult life in a woman of 42 ; in general features and the absence of osteoporosis the condition resembled tropical sprue. Tetany was a marked feature with positive Trousseau's and Chvostek's signs. The patient had been under treatment for tetany with calcium gluconate, campolon, etc., without relief, but on the administration of 150 mgm. nicotinic acid daily remarkable improvement took place. The tetany vanished and the glossitis abated, but two months after discharge the disease returned with grave emaciation and continuous tetany with low blood calcium (6 mgm. per cent.) and the result was fatal. A second, similar, case in a woman of 34 is quoted and the authors express the opinion that they may be accepted as examples of a syndrome indistinguishable from *tropical sprue* manifesting itself in a non-tropical country.

The nature of the syndrome (jejuno-ileal insufficiency) is defective absorption from the small intestine and there is something more extensive than mere inability to absorb fat and fat-soluble substances. The clinical picture is one of chronic jejuno-ileal insufficiency, so that in sprue and coeliac disease we see the effects of gross interference with the total function of the small intestine. The result is carbohydrate dyspepsia with gaseous distension of the bowel. The fat, though split, cannot be digested and produces steatorrhoea. The sugar is poorly absorbed, resulting in the flat glucose curve, with the result that blood-urea and serum protein are often low also. Poor absorption of salts results in tetany and defective ossification ; defective absorption of iron is followed by hypochromic and megalocytic anaemia owing to failure to absorb the anti-pernicious anaemia factors. Toadskin and xeropthalmia proclaim deficient vitamin A ; sore tongue, oedema, angular stomatitis, defective growth and pellagra result from deficiency in vitamin B complex ; rickets, infantilism and sterility from deficiency of vitamins D & E. Sudden haemorrhage in some cases denotes a similar defect of vitamins K or P.

The ultimate proof of the nature of the syndrome lies in the evidence provided by gastrocolic fistula—in this condition diarrhoea and loss of weight are severe, with macrocytic anaemia, sore tongue and hypocalcaemia. The resemblance to tropical sprue or idiopathic steatorrhoea is striking. A gastro-colic fistula creates a complete general disturbance and in most cases there is a short-circuit uniting stomach, small and large intestines. Such a case is described in a man of 46, who developed the sprue syndrome complete with glossitis, which reacted instantaneously to nicotinic acid therapy. The steatorrhoea (56 per cent. total fat), macrocytic anaemia and tetany were present also. Following a laparotomy, which restored the normal continuity to the bowel, complete recovery ensued. It was found that the fistula had been due to leakage from a duodenal ulcer. It is therefore concluded that the same syndrome, in its major aspects, is present in all these conditions, though usually it is possible to identify the disease responsible for each case.

[Views somewhat similar to those of the reviewer on the aetiology of sprue have been expressed by Nicholls, this *Bulletin*, 1936, Vol. 33, p. 65.] *P. H. Manson-Bahr.*

VEDDER (Edward B.). **A Discussion of the Etiology of Sprue.**—*Amer. Jl. Trop. Med.* 1940. May. Vol. 20. No. 3. pp. 345–357. [38 refs.]

This is an exceptionally clear exposition of a difficult subject. Professor Vedder refers briefly to some of the older and now discarded views on the causation of sprue, calls attention to the chief symptoms and their probable pathogenesis, and finally presents yet another theory—pituitary dysfunction—on grounds which, as the author frankly admits, are purely theoretical.

Since the symptoms of sprue may lie latent for many years after a man has ceased to live in the tropics, what *essential* differences are there, he asks, between tropical and non-tropical sprue? Points on which the dualists are accustomed to rely are disposed of by saying that cases of non-tropical sprue are not recognized early, last longer and, in consequence, the symptoms may be more pronounced. The sequence of symptoms is then given on lines reminiscent of the " house that Jack built " or the dangers of procrastination in " for want of a nail the shoe was lost " and this mode of presentation is, really, very instructive. The stages are as follows: Primarily, a functional disturbance of the small intestine, as a result of which there is impairment of absorption of food; impairment of food absorption entails reduction of fat absorption, and this means steatorrhoea; owing to the steatorrhoea diarrhoea develops; impairment of absorption means less glucose absorbed, and from this intestinal fermentation, gaseous distension, and frothy stools. Owing to the diarrhoea there is reduced absorption of calcium and of iron and the result of the latter is hypochromic anaemia. Deficient absorption of vitamins aggravates the intestinal symptoms and the vicious circle is complete.

Speaking of the last in a little more detail: Deficiency of vitamin A impairs gastric and intestinal glandular activity and leads to failure to produce sufficient antianaemic principle; deficiency of vitamin B_1 diminishes appetite and reduces motility of the digestive tract [but sufferers from sprue complain of undue and inconvenient motility]; there may be some deficiency of vitamin B_2, *e.g.*, the riboflavin constituent, which may explain certain affinities between pellagra and sprue; vitamin D deficiency, evidenced, for example, by osteoporosis, is rare in tropical sprue [many maintain that osteoporosis never occurs in tropical sprue and is an important point of distinction from the non-tropical] because the tropical sunshine supplies it adequately; vitamin K is said to be deficient and this is evidenced by prothrombin deficiency and prolonged coagulation time.

The author concludes that sprue appears to be associated with hormonal inadequacy—parathyroid, thyroid, adrenal—and that the anterior pituitary exercises control of various hormones, including these, and it may control intestinal function, and he adds:

" Let us assume that . . . . a functional failure in some degree of the anterior pituitary secretion is responsible for the failure of the function of absorption of the intestine, and that this pituitary hypofunction is precipitated in some individuals by tropical service."

[This article is not only instructive, but entertaining; unfortunately the theory rests on this " Let us assume," and, as stated earlier, for this the author himself says " no proof has been afforded." If proof

can be adduced all tropical workers will be grateful to see the solution of this vexed problem ; if disproved, it looks as if this house will fall as did its predecessors.] *H. H. S.*

Pock-Steen (P. H.). Die Differentialdiagnose der sprueartigen Erkrankungen. [**Differential Diagnosis of Sprue-like Diseases.**]—*Schweiz. Med. Woch.* 1940. May 4. Vol. 70. No. 18. pp. 385–392. [60 refs.]

[This is an abstruse, or at least abstrusely worded, article and after repeated readings the abstracter doubts whether he has really grasped the thesis put forward. But, so far as he does understand it the case is as follows.] It would appear that there are two main factors concerned in the production of sprue : 1. Histamine intoxication ; 2. Loss of vitamin B_2. On this basis the author has built up a complicated table, or series of tables, to demonstrate the connexion between sprue and sprue-like diseases, which he designates as *incipient sprue*, which may go on to *prosprue* on the one side and *pseudosprue* on the other. Either of these may pass over to *anatomical* sprue, the last being no longer affected by antiparasitic treatment whereas pseudosprue may be.

A second table deals with *metabolic sprue*. Here again a twofold action is at work. From climatic causes there is produced an adrenal insufficiency and from it there result on the one hand a histamine toxicosis and on the other activation of phosphorylizing ferments, and the latter, by interfering with resorption of vitamins, fats and glucose, leads to deficiency of vitamin B_2 and to *prosprue*, and the histamine toxicosis to *incipient* sprue, the so-called " reversible prosprue " passes on to " irreversible anatomical sprue."

A third table gives the author's view of the sequence in *enterogenous sprue*. Here also is a twofold action : Excessive acid production in the colon by bacterial action, and inhibition of defensive ferment activity by histamine and by parasitic action. Resorption of the acid products (H-Stoff) leads to central and peripheral irritation (or stimulation), the former giving rise to incipient sprue and the latter to a mixture of cutaneous (eczema, urticaria), rhinopulmonary (paroxysmal sneezing, rhinitis, asthma) and intestinal symptoms, toxic inhibition of ferments as in metabolic sprue, malabsorption of vitamins, fats and glucose, leading to pseudosprue and then to anatomical sprue. Prosprue, the author speaks of as " reversible," pseudosprue and anatomical [? tropical] sprue as " irreversible." [It all seems very hypothetical and to have no very intimate relation with the title of the article.]

H. H. S.

Pasricha (C. L.) & Lal (S.). **The Incidence of Monilias in Human Faeces.**—*Indian Med. Gaz.* 1939. Nov. Vol. 74. No. 11. pp. 682–683.

Ashford's theory that a monilia is the cause of sprue seems to be as hard to kill by argument as the fungus itself. Eleven years after the theory was suggested and in spite of much accumulated evidence against its acceptance Mackie and Chitre by experimental work [see this *Bulletin*, 1929, Vol. 26, pp. 498–9] and by clinical investigations [*idem*. 1930, Vol. 27, p. 349] would be thought to have laid the spectre by recording the results of examination of 71 patients with sprue and

76 non-sprue patients. They found monilias as frequently in one group as in the other. The authors have thought it might be useful to re-open the question by examining a number of Indians and Europeans, either healthy or suffering from diseases other than sprue to determine whether they were passing monilia in their stools and, if so, in what proportion. Of 146 [144] Indians on Indian diet, 106 or 73 per cent. were passing monilia which was isolated; of 76 Europeans on European diet 34 or 51·3 per cent. Of 60 suffering from intestinal disease (but not sprue) 45 or 75 per cent. were passing monilia, as were 99 out of 160 apparently healthy subjects (62 per cent.)—together in 144 out of 220 (65 per cent.). [There is a little discrepancy in one section of the protocol, in which the total examined amounts to 222, not 220, and the total positive to 145, not 144; but this does not vitiate the finding that monilia is found almost equally prevalent in the stools of healthy and diseased individuals in the tropics and that there is no justification for regarding it as of aetiological importance in sprue.]

H. H. S.

Rodriguez-Molina (R.). **Hematology of Sprue. Report on 100 Cases in Puerto Rico.**—*Puerto Rico Jl. Public Health & Trop. Med.* 1939. Sept. Vol. 15. No. 1. pp. 89–100. [21 refs.] [Spanish version pp. 101–110.]

[Study of the peripheral blood in cases of sprue still goes on in spite of the fact that no more serviceable end seems to be attained than a fruitless ploughing of the sand.] The author records the results of detailed examination of the blood in a hundred cases of sprue before treatment. Fifty-seven were males, 43 were females, and their ages ranged between 12 and 78 years. Briefly stated, erythrocytes varied between 0·84 and 4·47 millions per cmm., haemoglobin between 3·7 and 16·0 gm. The chief, perhaps only, fact of value in this respect is that 90 per cent. of patients showed anaemia of the macrocytic type—confirmation of what has been known for years. The mean corpuscular haemoglobin ranged between 19 and 61 micro-micrograms, the volume of packed cells between 9·8 and 47·9 cc. per cent. When the red cell count fell below two millions erythroblasts were more numerous. Leucocyte counts varied between 950 and 9,800 per cmm.; in nearly half the cases (43·5 per cent.) the count was within normal limits. Reticulocytes ranged between 0 and 12 per cent. and platelets between 40,000 and 290,000.

The anaemia of sprue has been spoken of as "aplastic," but the author's evidence is much against this view; it is true that the cellular elements are decreased, but the presence of reticulocytes, of erythroblasts and polychromatism is the rule rather than the exception and the bone-marrow findings tend more to the hyperblastic type. [As already stated examination of the peripheral blood in sprue reveals changes within such widely separated limits that nothing of value can be deduced. A comparison of the conditions present before treatment and at various stages after treatment is begun might be more profitable.]

H. H. S.

Rodriguez Molina (R.). **Sprue in the Puerto Rican Indigent.**—*Bol. Asoc. Med. de Puerto Rico.* 1940. June. Vol. 32. No. 6. pp. 187–195.

Amalfitano (Gabriele). Sul significato e il valore diagnostico della prova del ramnosio di Castellani. [**The Diagnostic Value of Castellani's Rhamnose Test.**]—*Policlinico.* Sez. Prat. 1939. Nov. 20. Vol. 46. No. 47. pp. 1999–2002.

The rhamnose test is intended as a gauge of absorption of monosaccharide sugars from the intestine and if it fails to appear in the urine this has been held to be diagnostic of sprue. [See this *Bulletin*, 1938, Vol. 35, p. 53.] The author reports that he has carried out the test on some hundred cases which included patients suffering from infective diseases, respiratory, cardiovascular and renal affections, hepatic and blood diseases, intestinal conditions including gastric and duodenal ulcer, gastro-enteritis, amoebic and bacillary dysentery, mucous, membranous and ulcerative colitis, intestinal tuberculosis, helminthic infestations and one case of sprue. Among these the result was negative in two only, the sprue patient and one with anaemia of pernicious type. The author, therefore, regards the test as of great diagnostic (and even of prognostic) value. As stated before the value would be even greater for prognosis if the test could be made quantitative. *H. H. S.*

Rodríguez Olleros (A.) & Hernández Morales (F.). El estómago en el síndrome "esprú tropical." (Cromoscopia.) [**The Gastric Function in Tropical Sprue.**]—*Puerto Rico Jl. Public Health & Trop. Med.* 1940. Mar. Vol. 15. No. 3. pp. 274–282. [16 refs.]

The authors investigated the elimination of a dye—neutral red—by the gastric mucosa in cases of sprue and other diseases and find this is more rapid in sprue patients than in those with the same degree of hydrochloric acid secretion but suffering from disease other than sprue. By this test, which is designated "gastric chromoscopy," sprue and pernicious anaemia may be differentiated. The procedure is as follows: After a 12-hour fast, the patient is given 0·2 gm. of caffeine in 300 cc. water coloured with two drops of a solution of methylene blue to stimulate gastric secretion. The result is analysed and after the stomach has been emptied 5 cc. of 1 per cent. neutral red are injected into the gluteal region. If the gastric contents are found to contain no free HCl, histamine is injected subcutaneously at the same time. Thereafter the gastric contents are withdrawn every five minutes till the red colouration is seen and the interval between the injection and the appearance of the dye in the stomach is noted.

In a table are given the findings in 27 cases of sprue, in one where the diagnosis rested between sprue and pernicious anaemia and in one case of pellagra. In twenty-one sprue patients no histamine was needed. Five had normal gastric secretion and the time for elimination of the dye was, in one case 15 minutes, in all the others 10 minutes. Twelve had hypo-acidity and the time varied from 5 to 40 minutes; three had hyperacidity and the times were 10 minutes in one, 15 minutes in two. In six receiving histamine the time ranged between 10 minutes (2 patients) and 35 minutes (2), the others being 15 and 30 minutes. The pellagrin and the doubtful patient had anacidity and histamine was given, but no neutral red appeared. The diagnosis in the latter was consequently pernicious anaemia. *H. H. S.*

Hand (Robert F.). **The Diagnosis and Treatment of Sprue.**—*Glasgow Med. Jl.* 1939. Dec. Vol. 132. No. 6. pp. 209–217.

This is a satisfactory statement of the main facts known regarding sprue and its present-day treatment, and will be of much service in directing the attention of the general practitioner to the existence of such cases in the British Isles, for symptoms may not appear until the patient has returned from the tropics and even for some years after, and failure to recognize the condition means delay in proper treatment and needless prolongation of suffering and perhaps death.

H. H. S.

Le Roy & Chertin. Un cas de sprue tropicale avec anémie extrême para-biermérienne. Guérison. [**A Case of Tropical Sprue with Extreme Pernicious Anaemia. Cure.**]—*Bull. Soc. Path. Exot.* 1940. Mar. 13. Vol. 33. No. 3. pp. 181–188.

[Reading the detailed records of this case, the reviewer is led to doubt strongly the diagnosis, either of the sprue or the pernicious anaemia.] The authors divide the course of the disease in this patient into three stages: 1. That of endocrine disturbance. 2. That of intense pernicious anaemia. 3. Convalescence and recovery. The facts to be placed before readers are as follows:—

A soldier, 31 years of age, was in hospital at Hanoi on account of dysentery. He was repatriated to France and improvement was marked; stools, 1–2 daily, became normal and he gained 4 kgm. in weight. Some 4–5 months after arriving in France he was again admitted to hospital with abdominal pain, vomiting, diarrhoea (5–6 stools daily, greenish-yellow like "cow-dung"). The liver was enlarged and painful and there was albuminuria. The blood examinations are detailed, they were made almost weekly from October to February, and the very abrupt changes are peculiar. Thus, successive findings were: r.b.c. 4,740,000, Hb. 90 per cent., C.I. 0·9; a month later red cells 1,990,000, Hb. 75 per cent., C.I. 1·9; then at weekly intervals, 800,000, 60 per cent., C.I. 3·9 [!]: 895,500, 40 per cent., 2·5; 1,270,000, 45 per cent., 1·8; 1,570,000, 45 per cent., 1·5; 2,290,000, 80 per cent., 1·8; 3,060,000, 90 per cent., 1·5; 3,280,000, 90 per cent., 1·4; 4,260,000, 90 per cent., 1·0; 4,520,000, 90 per cent., 1·0; 5,440,000, 95 per cent., 0·9. In the same time the leucocytes were also very variable in total, ranging between 1,100 and 7,400 per cmm. with a high percentage of lymphocytes, up to 56. Very rarely were any erythroblasts seen, and no anisocytosis.

Treatment comprised absolute rest in bed, diet of meat juice, calves' liver nearly raw, and lemon and orange juice, and vegetable soups (milk was badly tolerated). Medicinally, calcium chloride by mouth, hydrochloric acid, adrenalin subcutaneously, cachets of pancreas, of gastric mucosa and extracts of spleen. The diagnosis of sprue is based on the presence of Monilia, on steatorrhoea, greyish aspect of face and the hypochlorhydria. Blood calcium was diminished. [On the other hand, the presence of Monilia has no diagnostic significance, no analysis of the stools is recorded, the liver was *enlarged*, the stools were greenish-yellow, the corpuscle reduction was marked but the haemoglobin remained abnormally high.] *H. H. S.*

Canova (F.). Alterazioni nervose nella sprue. [**Nervous Disturbances in Sprue.**]—*Riforma Med.* 1939. Nov. 18. Vol. 55. No. 46. pp. 1637–8, 1641. [12 refs.]

The two cases recorded are of interest in that both patients presented symptoms suggestive of tabes—unequal pupils, Rombergism, loss of patellar reflex—or of polyneuritis—pain along nerve trunks, steppage gait, loss of deep reflexes—but the Kahn reaction was negative to repeated tests with serum and cerebrospinal fluid and gastric and other crises were absent, and the diet was fairly varied. Other symptoms are said to have been " characteristic of sprue " and in the case of the second, a man of 30 years, the stools were fatty and frothy and there was stomatitis ; nothing is said in regard to this in the first patient. [In the absence of more detail and of laboratory investigations, the diagnosis seems to have a somewhat exiguous foundation.]

H. H. S.

Napier (L. Everard). **Tropical Sprue. A Résumé of a Lecture.**—*Indian Med. Gaz.* 1939. Nov. Vol. 74. No. 11. pp. 688–692.

Hughes (William). **Sprue and the Steatorrhoeas.**—*Jl. Trop. Med. & Hyg.* 1940. Apr. 15 & May 1. Vol. 43. Nos. 8 & 9. pp. 105–110 ; 122–126. [57 refs.]

Salvesen (Harald A.) & Kobro (Mikael). **Symptomatic Sprue.**—*Acta Med. Scandinavica.* 1939. Vol. 102. No. 4–5. pp. 277–294. With 4 figs. on 2 plates. [24 refs.]

In this paper five cases of symptomatic sprue are reported, in all of whom steatorrhoea was an outstanding feature ; all the other sprue symptoms were regarded as secondary to malabsorption of fat. Two cases were examples of isolated granulomatosis of the small intestine and the mesenteric lymphatic glands. The third was one of tabes mesenterica in an adult with extensive tuberculosis of the entire mesentery and destruction of the glandular apparatus. The fourth case was one of gastrocolic fistula ; in the fifth there were two strictures of the small intestine attributed to X-ray treatment for menorrhagia eighteen years previously.

The authors discuss the bearing of clinical, biochemical and pathological data collected in these cases on the aetiology of so-called idiopathic steatorrhoea, and suggest that the cause of the disease is to be found in the lymphatic apparatus of the mesentery somewhere along the route from the intestinal wall to the larger collecting vessels. [In tropical sprue Fairley and Mackie investigated this possibility fourteen years ago and failed at post-mortem to find any evidence of lymphatic obstruction or disease of the lymphatic glands.] In support of this contention the authors cite a number of cases in the literature in which lymph stasis has been observed at autopsy in non-tropical sprue, and conclude that " sprue, anyway the non-tropical form, cannot be regarded as a disease *sui generis*." [See also this *Bulletin*, 1930, Vol. 27, p. 1024 ; 1932, Vol. 29, p. 463 ; 1936, Vol. 33, p. 69.]

N. Hamilton Fairley.

RØE (O.). Et tilfelle av sprue. [**A Case of [Non-Tropical] Sprue.**]—*Nordisk Med.* 1939. Nov. 11. Vol. 4. No. 45. pp. 3336–3338. English summary.

The case here described is entitled "sprue," though the patient, a girl of 9 years, had not been abroad. In its symptoms the case showed more resemblance to true sprue than the majority of cases of idiopathic steatorrhoea. The number and character of the stools, the ratio of neutral fats to fatty acids, the reduction in serum-calcium, the phosphorus content, all were such as occur in sprue. On the other hand, the absence of stomatitis, the great changes in the blood, the early relapse after treatment, are more characteristic of idiopathic steatorrhoea. Osteoporosis, commonly seen in the latter, not in the former, is not mentioned nor is any measurement of the corpuscles. The blood changes were very marked. When first examined red corpuscles numbered 1,010,000 per cmm., and haemoglobin 20 per cent., colour index 1 ; two months later 6,260,000 and 75 per cent., C.I. 0·6 ; after another four months, 3,570,000 and 52 per cent., C.I. 0·7, and a fortnight later 2,530,000 and 35 per cent., C.I. 0·7 ; no erythroblasts were noted. The patient received ten injections of lactoflavine, each of 1 mgm., and eight of campolon, each of 5 cc., but without effect.

H. H. S.

HUGHES (Laurence). **Steatorrhoea.**—*Med. Jl. Australia.* 1939. Nov. 4. 26th Year. Vol. 2. No. 19. pp. 671–676. With 8 graphs. [23 refs.]

HANSMAN (F. S.). **Steatorrhoea.**—*Ibid.* pp. 677–680. With 2 figs.

Neither of these papers contributes anything fresh on the subject of sprue ; they were not intended to deal with tropical sprue. They were papers read and discussed at a meeting of the New South Wales Branch of the British Medical Association. Dr. Hughes deals with steatorrhoea as a symptom of coeliac disease of children. Dr. Hansman with the physiology of fat ingestion, digestion, absorption and excretion. None of the speakers had had much experience of tropical sprue but the general consensus seemed to be that it is a condition distinct from coeliac disease, idiopathic steatorrhoea, and what has been repeatedly spoken of as "non-tropical sprue." The majority of those who are acquainted with these various conditions will agree with them.

H. H. S.

LEPROSY.

Précis of Abstracts in this Section.

ROGERS *et al.* (p. 20) show that 87 lepers have been seen in the British Isles during the last few decades. More than half of these are dead or have been repatriated and of the 40 remaining, 22 have disease of the lepromatous type. The position with regard to the possibility of spread is satisfactory but the authors advise isolation in the St. Giles Home for those who cannot carry out home isolation.

Lowe and Santra (p. 21) found an incidence of 7·4 per cent. in an area of N. Bengal, but only 4·1 per cent. of the cases were of infective lepromatous type. The incidence in children was relatively low. Davey (p. 21) shows that in Nigeria leprosy surveys are followed up by the foundation of clinics and villages for segregation, which are visited regularly by the headquarters staff. In the surveys an incidence of 3·3 per cent. was found. Details of organization are given and it is thought that the system will help to control the disease.

From a study of leprosy in N. America, Aycock (p. 21) concludes that hereditary susceptibility is a major factor in the propagation of the disease, rather than family contact.

Badger *et al.* (p. 22) have studied four strains of acid fast bacilli cultivated from leprosy patients, but have not found evidence that they were concerned in the aetiology of the disease.

Collier (p. 22), in a preliminary report, shows that monkeys fed on Colocasia and inoculated with human leprosy material showed lesions at a time when no lesion was apparent in control animals. Oberdoerffer and Gehr (p. 22) discuss the world incidence of foods containing sapotoxin, in relation to leprosy.

Lamborn (p. 22) has found leprosy bacilli in the faeces of *Periplaneta orientalis* for as long as 66 days after feeding on dressings from leprosy sores. In control cockroaches saprophytic acid-fast bacteria only were found.

Cowdry (p. 23) discusses the globi of leprosy bacilli seen in skin lesions and in giant cells which probably take origin from components of the reticulo-endothelial system.

Cousin *et al.* (p. 23) discuss the hyperpolypeptidaemia often found in leprosy.

Pesce (p. 24) has devised a method of expressing the different forms of leprosy by means of a single numerical symbol.

Chala *et al.* (p. 24) report the results of sternal puncture in leprosy. Berny and Mauzé (p. 24) describe a new diagnostic skin test, in which the antigen is prepared from the urine of bacteriologically positive cases of leprosy. It is claimed to be positive in 100 per cent. of lepers, but negative in controls. Nolasco (p. 25) found that only 4 of 48 lepromatous patients were positive when tested with lepromin while they were in various states of the lepra reaction. He concludes that this does not support the view that the lepra reaction is a manifestation of allergy. Ermakova (p. 25), however, regards the reactive stage of leprosy fever as an allergic state, and describes the condition found.

Collier and McKean (p. 26) have obtained shrinkage or softening of nodules by treatment with diphtheria antitoxin in about 50 cases. The acid fast bacilli became granular or broken up. No such results were obtained in controls treated with tetanus antitoxin or antivenene. Similar results were obtained with diphtheria toxoid, but with nerve cases the effects were less evident, though some improvement was found. The treatment appears to be very promising.

Cochrane *et al.* (p. 27) report that the substitution of a wheat diet in place of rice has considerable effect in relieving the neuritic and bone pains of leprosy, but does not hasten the improvement in the lepromatous condition. Gminder (p. 27) reports unsatisfactory results from the use of Solganal B in treatment of generalized leprosy. De (p. 27) finds that creosote acts as an anti-oxidant when used as a preservative in hydnocarpus oil.

In the *International Journal of Leprosy* (p. 27) are given the opinions of a number of workers on the subject of the regulations which should govern travel by persons with leprosy, especially of non-infective type. The opinions cannot be further abstracted but it may be noted that there is little unanimity, and the matter needs to be regulated.

BUKER (p. 28) reports on 9 leper colonies in Upper Burma. SITANALA (p. 28) discusses the leprosaria of the Netherlands Indies.

Rat Leprosy. KRAKOWER and GONZÁLEZ (p. 28) find great similarity between the bacilli of mouse and rat leprosy, but BADGER and FITE (p. 29) find variation in virulence in different strains of rat leprosy bacilli isolated from wild rats.

FITE (p. 29) shows that when rat leprosy bacilli are injected they are ingested by polymorphonuclear leucocytes and that giant cells are formed by fusion of histiocytes in recent foci.

RIBEIRO (p. 29) found that one fraction of certain vegetable carotinoids has some effect in changing the distribution of the bacilli when used for treatment of rat leprosy.

BADGER *et al.* (p. 29) have found that in rats deficiency of vitamin B_1 leads to increased susceptibility to rat leprosy. Deficiency in calcium leads to inability to utilize the vitamin B_1 available in the diet.

C. W.

ROGERS (Leonard), COOK (J. Howard) & MUIR (E.). **Leprosy Cases in the British Isles.**—*Brit. Med. Jl.* 1940. July 6. pp. 7–8. Also in *Leprosy Review.* 1940. Oct. Vol. 11. No. 4. pp. 170–173.

This report of a committee of the British Empire Leprosy Relief Association deals with the data regarding the number of cases of leprosy seen in the British Isles during the last three or four decades by the leading dermatologists, who filled in forms sent to them for the purpose. The number had frequently been guessed to be about 100, but the probably not quite complete data tabulated show 87, of whom 23 at the time of the enquiry were known to be dead, 13 had been repatriated, and 11 not seen for over ten years are presumed to be dead or repatriated. This leaves 40 cases for further consideration, including 8 last seen within ten years, regarding whom no recent information is available, but who are presumed to be still alive and in this country. Of these 40, 17 are slightly infective neural cases and one a mildly infectious tuberculoid case. The remaining 22 belong to the more dangerous lepromatous type but 5 of these are isolated at the St. Giles Home. Two are isolated with careful precautions at their homes, 2 have passed into a quiescent, little infective condition under expert treatment, 4 were reported from the Tropical Diseases Hospital, so will have been instructed in the necessary precautions, and 5 more are under expert treatment and advice. In the remaining four the conditions of living were reported to be unsatisfactory at the time they were last seen, some years ago.

The Committee conclude that the present position is reassuring in view of the fact that nearly all the infective cases are under expert care and many of them have reached an age when they are unlikely to come into close contact with susceptible children. They, however, advise that the few infective patients, who are not in a position to

carry out effective home isolation, with prohibition of close contact with children, should, as far as possible, be accommodated at the St. Giles Home. *L. Rogers.*

Lowe (John) & Santra (Isaac). **An Epidemiological Study of Leprosy with Special Reference to the Leprosy Survey in Santalpur (North Bengal).**—*Leprosy in India.* 1940. Apr. Vol. 12. No. 2. pp. 43–54. [13 refs.]

The authors report on a survey of 3,600 Santals in North Bengal. They found the high incidence of 7·4 per cent., but the proportion of infective lepromatous cases was only 4·1 per cent. of the total cases, with a relatively low incidence among children and a high incidence in adults and old people. They therefore conclude that, in spite of the high incidence of leprosy, the disease does not constitute an important health problem in this area. *L. R.*

Davey (T. F.). **First Report on Leprosy Control Work in the Owerri Province, S. Nigeria.**—*Leprosy Review.* 1940. July. Vol. 11. No. 3. pp. 123–134. With 1 map.

This is a further report on the successful prophylactic measures in use in South Nigeria in a large tract of country surrounding the Uzuakoli Leper Colony. Surveys are followed up in the Owerri Province, 150 miles in length by 60 in width by the foundation of clinics and villages for segregation of the more infective cases within reach of treatment, which are visited and treated once a week by the headquarters staff. During 1939, 11,689 people were examined and 401 cases, 33 per mille, found. Land was given by the chiefs and the necessary simple buildings constructed by the patients themselves at no cost to the colony. At the end of 1939, 1,243 cases were being treated and the numbers were increasing rapidly. A leper nurse was provided for each clinic ; these clinics are built near motor roads and the patients are found to attend regularly, and obvious improvement is seen in many of them. In one centre every infectious case is now isolated in the leper village, the houses of which are superior to those in the surrounding villages, so that lessons in sanitation are being provided for the people. Leprosy inspectors are being trained and courses given to both teachers in the schools and to sanitary inspectors, and medical officers are also being trained. Thus the influence of the Leper Colony is being extended to extensive surrounding areas at a very low cost, and must in time materially help in controlling leprosy in the whole province. *L. R.*

Aycock (W. Lloyd). **Familial Susceptibility as a Factor in the Propagation of Leprosy in North America.**—*Internat. Jl. Leprosy.* Manila. 1940. Apr.–June. Vol. 8. No. 2. pp. 137–150. With 3 figs. [11 refs.]

This paper deals at some length with the well known histories of the introduction and spread of leprosy in French families in New Brunswick from 1815, in Louisiana from 1766, and among Scandinavians in Minnesota in the second half of the nineteenth century. Contrary to the general opinion that family contagion best explains the facts, the author concludes that the data of these outbreaks of leprosy in several

localized areas " indicate that hereditary susceptibility is a major factor in the propagation of leprosy on the North American continent."

L. R.

BADGER (L. F.), PATRICK (D. W.), FITE (G. L.) & WOLFE (Don). **I. Leprosy : Two Strains of Acid-fast Bacilli isolated from a Case of Human Leprosy. A Comparison with Other Strains of Acid-fast Organisms with Particular Reference to the Lleras Bacillus.**—*Nat. Inst. of Health Bull. No. 173.* Washington. 1940. pp. 1–44. [26 refs.]

This is a full study of four acid-fast bacilli cultivated from leprosy patients, two from one patient. The authors conclude that no evidence was obtained that any of them were aetiologically related to the disease and that complement fixation and skin sensitivity tests are nonspecific and of no diagnostic significance. *L. R.*

COLLIER (D. R.). **Inoculation of Monkeys with Leprosy following a Diet of Puak (Colocasia). A Preliminary Report.**—*Leprosy Review.* 1940. July. Vol. 11. No. 3. pp. 135–140.

The author records that, in accordance with the idea of Oberdoerffer that the sapotoxins in certain food plants predispose to leprosy infection, he inoculated monkeys with human leprous material after feeding some of them on a diet of Colocasia. Of those inoculated six months or more all four female and one of the male monkeys showed positive results from the examination of nasal smears and ear and skin clips. The infected male monkey received injections of sapotoxins as well as the diet of Colocasia and the progress of the disease was faster in this case. Several months elapsed before symptoms of a similar nature to the human disease appeared, the nose first becoming positive. One animal developed thickening of the ulnar nerve. So far none of the control monkeys has shown any of the symptoms found in those fed on Colocasia. [For other references to Colocasia and leprosy, see this *Bulletin*, 1938, Vol. 35, p. 882 ; 1939, Vol. 36, p. 1021 ; 1940, Vol. 37, p. 626.] *L. R.*

OBERDOERFFER (Manfred) & GEHR (Emmo). Die Zusammenhänge zwischen sapotoxinhaltigen Nahrungspflanzen und der Lepra. [**The Association of Sapotoxins with Leprosy.**]—*Ztschr. f. Hyg. u. Infektionskr.* 1940. Apr. 7. Vol. 122. No. 4. pp. 472–502. With 7 figs. [197 refs.]

This is another lengthy paper in which the authors discuss the world incidence of sapotoxin-containing vegetable foods in relation to leprosy distribution in support of the hypothesis that these foods predispose to infection with the bacillus of leprosy. It should be consulted in the original by those interested in the subject. *L. R.*

LAMBORN (W. A.). **Cockroaches in Relation to *Mycobacterium leprae*.**—*Nyasaland Protectorate Ann. Med. & San. Rep. for Year ending 31st December, 1939.* Section VIII. pp. 28–31.

In continuation of his researches into the possibility of leprosy infection being conveyed by insects the author in this report deals

with cockroaches, which are very common in tropical countries. He used the familiar " black beetle " of Europe, *Periplaneta orientalis*, and *Nauphoeta cinerea*, both very common in Nyasaland where he worked. These he fed on dressings of leprous sores containing numerous lepra bacilli, and examined their droppings from day to day. He found the bacilli in the faeces at intervals after feeding up to the 66th day, and at the earlier periods they were present in the form of typical globi. The cockroaches might therefore infect food by their droppings. In control insects he did not find such appearances, although atypical acid-fast organisms, apparently of a saprophytic nature were occasionally met with. Attempts were made to infect white and wild rats with cockroach faeces containing leprosy bacilli, but so far with negative results. *L. R.*

Cowdry (E. V.). **Cytological Studies on Globi in Leprosy.**—*Amer. Jl. Path.* 1940. Mar. Vol. 16. No. 2. pp. 103–136. With 19 figs. on 5 plates. [39 refs.]

The long disputed nature of the masses of lepra bacilli in the giant or " foam " cells is discussed in this paper. They are found mainly in the dermal lesions, and occasionally in epithelial, lymphatic, endothelial or nerve cells. The conditions that determine the entry of the bacilli into cells are not known. The cigar packs of bacilli closely pressed together are most noticeable in macrophages, reticular cells and giant cells. Seed globi are wider and longer than the cigar packs, with ends that taper and contain more fluid. The investments of the larger globi are difficult to identify. There is a good deal of evidence against the giant globi being lodged in lymphatic vessels or capillaries. Giant globi occur in tissues devoid of lymphatics such as the pulp of the spleen and the central parts of hepatic lobules. In lymphatic nodules giant globi develop in the cortical substance distant from lymphoid sinuses. The conclusion advanced is that giant globi develop intracellularly in giant cells derived from components of the reticulo-endothelial system, monocytes, histiocytes, macrophages, reticular cells and, as representatives of special endothelial cells, the littoral cells of lymphoid sinuses. Lastly the collections of acid-fast bacilli in rat leprosy, Johne's disease and water buffalo leprosy develop intracellularly in cells of the reticulo-endothelial system such as the globi of human leprosy, but only those of water buffalo leprosy resemble the globi of human leprosy. *L. R.*

Cousin, Grenierboley & Nguyên-van-Minh. Sur la fréquence de l'hyperpolypeptidémie des sérums de lépreux et sur les difficultés de son interprétation. [**Hyperpolypeptidaemia in Leprous Sera.**]—*Ann. de l'Ecole Supérieure de Méd. et de Pharm. Indochine.* 1939. Vol. 3. pp. 157–158.

The author reports on the determination of polypeptidaemia in leprosy by means of the technique of Gouffon and Spaey. Of 89 sera examined, some more than once, in 7 the figure obtained was below 20 mgm., in 21 it was at the normal rate of 20 to 30, and in 53 the figure was above the normal. *L. R.*

PESCE (Hugo). Un simbolo individual combinado y un indice colectivo para expresar la evolución de la lepra. [**A Single Symbol to express Leprotic Conditions.**]—*Bol. Oficina Sanitaria Panamericana.* 1940. June. Vol. 19. No. 6. pp. 562–568.

By means of what the author calls a " collective index " he suggests a method of expressing the evolution of a case of leprosy. Since it is put forward by the Chief of the Anti-Leprosy Campaign in a district of Peru, it is thought that some notice should be taken of it, but, unless the reviewer has misconstrued the idea, its value would seem to be less than nil, for it would tend to mislead. He, so it appears, assigns a number 1, 2 or 3 to the stage of a cutaneous (lepromatous) or a nerve case, or in a mixed case adds the two and states the total. For example : L2=2,N2=2 ; L2 N1=3, L1 N2=3 ; 4 might therefore be a patient in the third stage of the cutaneous and the first of neural or the second of each, or the first of cutaneous and late, 3rd stage, neural. [What help that would afford to a compiler of statistics is beyond the power of the reviewer to assess.] *H. H. S.*

CHALA (J. Ignacio), BRUMPT (Lucien Ch.) & LLERAS RESTREPO (Federico). Punción de la medula osea en la lepra. [**Sternal Puncture in Leprosy.**]—*Rev. Colombiana de Leprologia.* Bogota. 1940. Feb. Vol. 1. No. 4. pp. 246–256. With 6 figs.

The value of this article is a little difficult to gauge. The authors state in their conclusions that they regard sternal puncture as a new method for diagnosis of leprosy and especially useful for finding Hansen's bacillus in cases where examination of the nasal mucus and gland juice has failed. They go on to say that they carried out sternal puncture in 15 leprosy cases and found the bacillus " eight times out of fourteen with lepromata and twice in the nervous form." There are no quantitative modifications of the myelogram but " foamy cells of Virchow " are present in those cases which show the bacillus.

[So much for the conclusions stated ; reference to the letterpress does not bear this out. A table of the 15 cases is given ; 8 of them are mixed forms, 5 nodular and 2 the nervous type. In four only is the bacillus stated as present in the marrow and in one only, of the nervous type, where the gland juice was negative. The gland juice was positive in 12 out of the 14, in the remaining two there is no mention of the findings whether positive or negative.] *H. H. S.*

BERNY (P.) & MAUZÉ (J.). Une nouvelle méthode de diagnostic de la lèpre par intradermo-réaction. (Note préliminaire.) [**A New Diagnostic Intradermal Reaction.**]—*Bull. Soc. Path. Exot.* 1940. Apr. 10. Vol. 33. No. 4. pp. 239–243.

The authors describe yet another intradermal reaction which they consider to be of diagnostic value. The antigen was prepared by the method of Max-Arom from the urines, which were free from albumin, of eight bacteriologically positive cases of leprosy. To a quantity of the mixed fresh urines three times the volume of 95 per cent. alcohol was added to form a precipitate, from which the fluid was decanted after 24 hours ; the precipitate was centrifuged and dried in a vacuum. To 100 cc. of filtrate of a 3 per cent. solution of the dry extract in physiological saline 10 drops of ammonia were added, and after further filtration the fluid was adjusted to a *p*H between 6·4 and 6·6 with acetic acid and preserved in ampoules in an ice box. For use 2 to

3 drops of the extract are injected into the skin of an arm and two drops of distilled water as a control in the other arm.

Tests have been carried out in 199 lepers of all stages, in 5 suspects and in 91 healthy subjects, and observations made after 8, 24 and 48 hours. In leprosy cases there is a rise of temperature to 38°C. or 39°C. in eight hours, and after 24 hours a papule exceeding 1 cm. in diameter appears, usually accompanied by erythema and pain. Such reactions are reported to have been obtained in 100 per cent. of lepers, but in none of the controls. *L. R.*

NOLASCO (J. O.). **The Lepromin Test in Lepra Reaction.**—*Internat. Jl. Leprosy.* Manila. 1940. Apr.–June. Vol. 8. No. 2. pp. 151–158. [17 refs.]

This further paper on the lepromin test has led the author to the following conclusions :—

" 1. Of forty-eight hospital patients with lepromatous leprosy in various states of lepra reaction that were tested with lepromin, only four, or 8·3 per cent., gave clear-cut positive reactions—one 3+ and three 2+. The 1+ reactions are considered not significant, a point to be discussed in a subsequent paper.

" 2. Irrespective of whether the patients were in the reaction state or not, retests made from two to four months after the original ones tended to give from slightly to moderately stronger lepromin reactions in twenty-four out of forty-eight patients (including the controls) that were retested.

" 3. No apparent relation in the intensity of the lepromin test to the presence of lepra reaction can be shown in the different groups into which the cases had been arbitrarily classified.

" 4. Similarly, no deductions can be made concerning the intensity of the lepromin test in relation to the time of the injection after the onset of lepra reaction in the mild, or mild brief and mild recurrent cases.

" 5. From the results of these studies, no apparent conclusion can be drawn to support the hypothesis that lepra reaction is a manifestation of allergy. Lepra reaction remains an obscure condition." *L. R.*

ERMAKOVA (N. I.). **The Histopathology of the Reactive Phase of Lepromatous Leprosy.**—*Internat. Jl. Leprosy.* Manila. 1940. Apr.–June. Vol. 8. No. 2. pp. 159–166. With 11 figs. on 2 plates.

Material obtained from a patient with lepromatous lesions who died during a reaction has been studied histologically by the author. He concludes that the reactive stage of lepra fever represents an allergic state. Degenerative and necrotic changes occurred in the smooth muscles, and haemorrhages and necrosis were met with. Numerous lymphoid, plasma and polymorphonuclear cells were noted. Where suppuration developed in the reactive nodules considerable degeneration of the bacilli, even to the loss of acid-fastness, occurred. The invading polymorphonuclear leucocytes exercise a fermentative action upon the cells of the specific granuloma and the bacilli. *L. R.*

DE BARROS (José Mendonça). Aspectos clínicos do comprometimento ocular da lepra. [**Some Clinical Aspects of the Ocular Involvement in Lepers.**] Serviço de profilaxia da lepra do estado de São Paulo-Brasil. Quarta Monografia dos Arquivos do Sanatório " Padre Bento." 1939.—pp. 1–47. English version pp. 49–79. With 60 coloured figs. on 31 plates & 37 figs.

COLLIER (D. R.) & MCKEAN (J. Hugh). **The Use of Diphtheria Antitoxin and Toxoid in Leprosy. A Preliminary Report.**—*Leprosy Review.* 1940. July. Vol. 11. No. 3. pp. 140–146. With 2 figs.

This paper is a preliminary report by experienced observers on the treatment of a number of leprosy cases by injections of diphtheria antitoxin and toxoid, with material improvement and disappearance of the lepra bacilli from lesions.

The trial was based on a supposition that adrenal insufficiency predisposes to leprosy infection. The antitoxin was first tried in the hope that it might neutralize leprosy toxin during leprous reactions. BABES had earlier recorded initial flattening out of nodules in two lepromatous cases treated with diphtheria antitoxin. At the end of 1938 some cases were treated with tetanus antitoxin and with antivenene as controls. Diphtheria antitoxin was used in reacting cases, beginning with 6,000 units and in many cases, after a temporary increase of fever, shrinking of nodules gradually took place, or in cases of more acute reaction the centre of the nodules softened to form purulent fluid containing acid-fast bacilli. These became granular or broken up to form acid-fast granules with almost complete absence of rods. In approximately fifty cases all responded in this manner, but in the controls treated with tetanus antitoxin or antivenene no appreciable changes were noted.

Some months later most of the cases had been free from further reactions, but certain of them showed marked improvement in local skin manifestations and general conditions. Smaller doses of 2,000 units of diphtheria antitoxins were then given at ten-day intervals with encouraging results in several cases, short notes of six of which are recorded. Diphtheria toxoid in 1 cc. doses was next tried in sixty cases of both types and in different stages of the disease, and the local and general reactions noted. It was found that definite shrinking of nodules occurred within two weeks, the vigour of the response being in direct relation to the severity of the disease. A month later the nodules and plaques were further reduced and might no longer be raised, and changes similar to those above described were found in the bacilli except where they were no longer to be found. In nerve cases the effects were less evident, but improved sensation was found in 50 per cent. and in a number enlarged ulnar nerves had become normal, together with improvement in muscular activity. Improvement in weight and general health was also noted. In several early cases in children a positive diagnosis could no longer be made. The authors state that longer time is necessary to enable the lasting nature of the improvement to be tested. Confirmation of these promising results will be awaited with interest. The doses of the formol-toxoid should be increased from 0·5 cc. to 2·0 cc. intramuscularly once a fortnight. *L. R.*

OBERDÖRFFER (Manfred). Vorläufige Mitteilung zur Leprabehandlung mit Formoltoxoiden, Diphtherieantitoxin und Nebennierenbestrahlung mit Kurzwellen. [**Preliminary Note on the Treatment of Leprosy with Diphtheria Toxoid and Antitoxin and with Short Wave Irradiation of the Suprarenals.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1940. Apr. Vol. 44. No. 4. pp. 180–181.

This brief note deals with some of the same cases as the above paper. *L. R.*

COCHRANE (R. G.), PAULRAJ (M.) & SALMOND (M. D.). **The Effect of Wheat Diet in the Relief of Certain Painful Complications and Sequelae in Leprosy.**—*Indian Jl. Med. Res.* 1940. Apr. Vol. 27. No. 4. pp. 963–969.

In the course of two years' investigations of certain diets in leprosy the authors have noted good effects of a wheat diet in place of rice in the relief of painful neuritis and certain distressing bone and joint pains. Other remedies for the painful condition had been previously tried without success, but the wheat diet relieved them without hastening improvement in the lepromatous condition, so is worthy of further trial for the relief of pain in leprosy. *L. R.*

GMINDER (Ernst). Bericht ueber sieben Fälle generalisierter Lepra, die mit Gold behandelt wurden. [**Gold Treatment.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1940. Apr. Vol. 44. No. 4. pp. 171–180. With 14 figs. [13 refs.]

The author records the results of treatment of seven generalized cases of leprosy by injections of 3 gm. of Solganal B spread over fifteen weeks. One patient improved, two became worse and the remaining four showed no change, so the results were unsatisfactory. *L. R.*

DE (N. K.). **Preservative Effect of Creosote on Hydnocarpus Oil.**—*Leprosy in India.* 1940. Apr. Vol. 12. No. 2. pp. 55–58.

Creosote has for long been added to hydnocarpus oil used for the injection treatment of leprosy, especially by MUIR. The present author has investigated the effect of this drug on the keeping qualities of the oil, and he concludes that creosote may act as an anti-oxident when hydnocarpus oil with a comparatively high peroxide value is stored so as to be exposed to the action of air, light and foreign impurities.

L. R.

INTERNATIONAL JOURNAL OF LEPROSY. 1940. Apr.–June. Vol. 8. No. 2. **Travel by Persons with Leprosy.** [Editorial] pp. 207–213; [Correspondence by various authors] pp. 214–220.

This note summarizes the opinions expressed in a series of letters on a question raised by Dr. B. MOISER regarding the difficulties of infected persons of British nationality travelling to the S. Rhodesia leper colony for treatment under the favourable climatic and other conditions available there, in view of the Rhodesian laws prohibiting the movements of leprosy patients. Dr. Moiser suggested that uninfective, bacteriologically negative " closed " patients should not be considered as infected, and so should be free to travel, but most of the correspondents demurred at that proposal. It was generally agreed that Europeans infected abroad should be allowed to return to their native country. In the United States the quarantine regulations prohibit the entry of lepers other than returning nationals even if they come from territories controlled by the U.S.A., such as the Philippines. In infected Malaya most of the patients are immigrant Chinese and Indians, and the Governor is empowered to exempt a foreign leper from being returned to his place of origin. Transportation by sea is often rendered prohibitive by steamship regulations. In South Africa lepers can only be transported by rail in a chartered

coach, which must then be subsequently disinfected. MUIR supports Moiser to the extent of maintaining that in a closed case the physician could refuse to make a definite diagnosis of leprosy and could label it "neuritis or dermatitis or any other general term, thus overcoming difficulties due to unreasoning prejudice." However, the laws of the United States and the Belgian Congo make no difference between closed and open cases. BURNET agrees that closed cases should remain free and at liberty to travel, especially if going to an institution for treatment, which seems reasonable, and others agree that infection from such is very unlikely, but BRIERCLIFFE insists on special conditions for their travel. It appears to be clear that century-old prejudices on the subject will not be overcome until the question is threshed out by some authoritative body, such as the International Leprosy Association. *L. R.*

BUKER (Richard S.). **Leper Colonization of Kengtung State, Burma.**—*Internat. Jl. Leprosy.* Manila. 1940. Apr.–June. Vol. 8. No. 2. pp. 167–178. With 1 fig.

This report deals with a leper colony in a Shan State of Upper Burma, opened in 1929, the inmates of which increased from 23 in 1930 to 225 in 1938. Homes are provided for uninfected children, and any male leper who wishes to marry must first be sterilized. Injections are given twice a week. At present nine colonies have been established with over 900 cases under treatment at a low cost. *L. R.*

SITANALA (J. B.). Het probleem der leprozerieën in Nederlandsch-Indië. [**Leprosaria in the Netherlands Indies.**]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1940. May 28. Vol. 80. No. 22. pp. 1370–1380. With 1 map.

The author gives a historical sketch of leprosy measures in the Netherlands Indies from 1655 to the present time. He states that there are now 47 leprosaria harbouring 4,955 lepers. Five of the institutions aim definitely at combating the disease, the remaining forty-two dealing with the leper from the philanthropic aspect. He draws up a table showing how the modern leprosarium differs from those of former days, in looking after patients in all stages, and not excluding infectious cases, in caring for and educating the children of lepers, in giving lepers occupation and useful work, and so on.

H. H. S.

KRAKOWER (Cecil) & GONZÁLEZ (Luis M.). **Mouse Leprosy.**—*Arch. Pathology.* 1940. July. Vol. 30. No. 1. pp. 308–329. With 7 figs. [15 refs.]

"Ordinary albino mice and rats are susceptible to infection with a bacillus of mouse leprosy originally derived from a brown mouse with the spontaneous disease. Subcutaneous, intramuscular and intraperitoneal routes of inoculation were employed. In both animals the resulting experimental disease is entirely comparable to that produced in rats by Stefansky's bacillus of rat leprosy. The lepromas in the rat and mouse differ in size, in some of their gross features and particularly in their histologic and cytologic structure. In view of the apparent greater infectiousness of the bacilli of mouse leprosy for mice as compared with that of the rat strain it is felt that there is probably some inherent biologic difference between the two."

Badger (L. F.) & Fite (G. L.). **III. Leprosy : Variations in the Virulence of Strains of Rat Leprosy.**—*Nat. Inst. of Health Bull. No. 173.* Wash. 1940. pp. 77–83.

Three strains isolated from wild rats and maintained in their laboratory have been studied by the authors by inoculation methods. Definite variation in virulence has been noted as shown by earlier generalization of the Hawaiian and Florida strains as compared with the San Francisco strain, the first named being the most virulent of the three, as shown by involvement of the liver and skin. This they regard as of great importance. *L. R.*

Fite (G. L.). **II. Leprosy : the Pathology of Experimental Rat Leprosy.** —*Nat. Inst. of Health Bull. No. 173.* Wash. 1940. pp. 45–76. With 8 figs. on 4 plates. [26 refs.]

This is a historical review from which the following conclusions are reached. On the subcutaneous inoculation of rat leprosy bacilli they are ingested by polymorphonuclear leucocytes. The giant cells are formed by the fusion of histiocytes mainly in newly formed foci. The chief defence consists in the localization and fixation of the bacilli within the lepra cells at the site of their deposition. *L. R.*

Ribeiro (Fonseca). **Murine Leprosy and Carotinoids.**—*Internat. Jl. Leprosy.* 1940. Apr.–June. Vol. 8. No. 2. pp. 179–192.

The author has separated three fractions from certain vegetable carotinoids and experimented with them in the treatment of murine leprosy. The A fraction, consisting of a resinous substance, yellow, soluble in fatty solvents and also in alkaline solutions, had the effect of altering the distribution of injected living rat leprosy bacilli so that their incidence resembled that of injected dead bacilli, namely that pieces of liver were negative instead of being positive, as after the injection of the living organism. The other two fractions were without such effect. *L. R.*

Badger (L. F.), Masunaga (E.) & Wolf (D.). **Leprosy : Vitamin B_1 Deficiency and Rat Leprosy.**—*Public Health Rep.* 1940. June 7. Vol. 55. No. 23. pp. 1027–1041. With 2 figs.

In view of the common belief in a relationship between nutrition and human leprosy the authors have made nutritional studies on rat leprosy with regard to Vitamin B_1 from which they come to the following conclusions. In rats on a diet deficient in vitamin B_1 the incubation period of rat leprosy is shorter than in controls, and the evidence indicated that this is due to an interference with the cellular defence mechanism of the animal. Susceptibility is also increased as shown by gross evidence of generalization of the infection due to the vitamin deficiency. Rats maintained on a calcium deficient diet are approximately as susceptible as those on a vitamin B_1 deficient diet, and they were found also to be deficient in the vitamin through inability to utilize the amount available in the diet, but this increased susceptibility is prevented if the calcium deficiency is supplemented by pure vitamin B_1. *L. R.*

Gavrilof (W.) & Fester (A.), Mme. Longue survie du bacille de Stephansky dans les cultures sur agar glycérine et sur milieu de Denys préparés avec du bouillon de peau de rat. [**The Long Survival of the Rat Leprosy Bacillus in Culture.**]—*Arch. Inst. Pasteur de Tunis.* 1940. Mar. Vol. 29. No. 1. pp. 102–104.

MALARIA.

Précis of Abstracts in this Section.

Roberts (p. 30) reports the finding, in East Africa, of an unusual malarial parasite of man which he considers to be a new species, and which he names *Plasmodium wilsoni* in honour of D. Bagster Wilson, who first demonstrated it. A description of the forms seen in man is given. In comment, Wenyon points out the necessity for complete investigation of all stages of the life-cycle in man and mosquito, and for demonstration that the specific characters are constant after many passages.

Pizzillo (p. 32) describes a case of malarial splenomegaly in which venous thrombosis developed and points out that complete absence of splenic contraction after intravenous adrenalin indicates the existence of thrombosis. Splenectomy is the only possible cure.

Pansini *et al.* (p. 33) note that some patients repatriated to Italy from Italian East Africa with malaria improved considerably even if no treatment was given, illustrating the beneficial effects of change of climate and good surroundings.

Yuge (p. 33) found a striking increase in the reticulocyte count after treatment of malarious children with atebrin. Cannistraci (p. 33) records his method of treatment with atebrin and plasmoquine; he advocates 0·3 gm. atebrin on one or two days a week as a prophylactic dose. Chopra *et al.* (p. 34) describe the action of Crinodora, an Italian preparation of atebrin. They (p. 34) also discuss acriquine, an acridine derivative which acts like atebrin. Ballero (p. 34) reports favourably on a new acridine derivative Italchina. Its action on the clinical manifestations of all forms of malaria is prompt, but it is inactive against crescents of *P. falciparum*.

Field (p. 35) reports failure of plasmoquine prophylaxis in an estate in Malaya where breeding of the vectors was not controlled. In treatment, Certuna was tried and found to have no effect on asexual forms of *P. falciparum*, though destructive to crescents. It is inactive in *P. vivax* infections. Certain other drugs tried were ineffective.

Schulemann (p. 35) summarizes his views on the development of malaria parasites and the relationship between the erythrocytic and the exo-erythrocytic schizonts. *C. W.*

Roberts (J. I.). **A New Malaria Parasite of Man in East Africa.**—*East African Med. Jl.* 1940. Sept. Vol. 17. No. 6. pp. 212–216.

During the examination of a blood film of a European in Kenya who had been Police Officer-in-Charge of the Abyssinian Refugee Camp at Isiolo a malaria parasite was encountered which, though causing enlargement of the red blood corpuscle, did not conform to the usual features of *Plasmodium vivax*. The gametocytes (not gametes)

were very heavily pigmented. The pigment appeared to be much denser and the trophozoite stages showed larger chromatin masses which in many cases were double. The gametocytes were " quartan-like " but were much larger than those of quartan parasites ; moreover there was a complete absence of band forms.

A number of slides from cases of suspected malaria from the Abyssinian refugees were then examined and the same parasite was found in many. This appeared to indicate that the parasite was a new species, and Dr. Bagster WILSON was consulted. He stated that he had encountered the same parasite in two African patients from Tanganyika some time before, but though he had called attention to their peculiarities he could obtain little support for the view that a new species was involved.

Subsequently a careful watch was kept for further cases and these have been found not only amongst the Abyssinians, but also amongst all races in East Africa during the epidemic of malaria. Clinically the cases are remarkable in that repeated relapses occur in spite of intensive anti-malaria treatment with quinine and atebrin, while at each attack very heavy infections develop. The author's description of the parasite, which he names *Plasmodium wilsoni*, is as follows :—

" (*a*) *The Parasite.*

" 1. Small parasites are very compact and bear a close resemblance to *P. ovale* parasites. Very few show an amoeboid appearance. Both nucleus and vacuole are well defined. Multiple parasites in one corpuscle are common, often three and sometimes four. " Equatorial," " meridional " or " Band " forms have not been observed.

" 2. Larger parasites are compact, but also with a well defined vacuole. If they have amoeboid features, this results in a " fragmented " appearance and not in the map-like or trabecular appearance of *P. vivax*. Pigment is yellow black and not aggregated. Parasites are often found lying outside the corpuscle.

" 3. Gametes are pale in colour with well distributed pigment. The pale blue protoplasm of the female is markedly different from that of *P. vivax*. When full grown, there is little cell margin round the parasite, but this usually shows traces of stippling.

" 4. The average number of merozoites appears to range from 10 to 12.

" (*b*) *The Corpuscle.*

" The corpuscle is always enlarged in parasites that are more than quarter grown, and sometimes greatly enlarged. This enlargement may be much greater than is ever seen in *P. vivax*. It sometimes results, in thin films, in making the corpuscles have an angular appearance, owing to the contact with adjacent corpuscles.

" Stippling is frequently absent, but a faint quartan type of stippling is sometimes seen. Such stippling as is seen is always finer than Schüffner's dots. A fine pink trabeculation of the corpuscle sometimes occurs.

" Infected red cells are usually decolourized."

[It seems clear that the author, and Dr. Bagster WILSON before him, have been dealing with a malarial parasite which is unusual. In his opening remarks the author states that the tardy recognition of Professor STEPHEN's account of *Plasmodium ovale* in 1922 gives rise to some apprehension when he launches into the malaria world a new species from the same area. The tardy recognition referred to " the long period which elapsed before proof was forthcoming to establish its validity as a new species." One may ask whether one has any justification for the establishment of a new species till the proof is forthcoming, the proof being the study of the whole life-cycle from its commencement both in man and the mosquito and the demonstration

that the specific characters are constant after many passages by mosquito transmission and are not the result of other factors such as those which Dr. Bagster WILSON himself has shown may affect the morphology of *P. falciparum* (see this *Bulletin*, 1939, Vol. 36, p. 676). To the reviewer it would seem that in the case of parasites which appear to occupy an intermediate position between any two of the well-known forms, as the one under discussion undoubtedly does, there can be no final agreement till the proof which will establish its validity as a new species is forthcoming, and it is his opinion that till the proof is forthcoming it is always a pity to introduce new names into medical literature.] *C. M. Wenyon.*

CAMBOURNAC (José C.). L'Institut de Malariologie de Aguas de Moura (Portugal). [**Institute of Malariology at Aguas de Moura, Portugal.**]—*Rev. du Paludisme et de Méd. Trop.* Paris. 1940. May 15. Vol. 2. No. 11. pp. 129–134. With 1 fig.

With the collaboration of the Health Division of the Rockefeller Foundation, a Malariological Institute was constructed in 1938 at Aguas de Moura, a small village 20 kilometres to the east of Setubal, in one of the most malarious regions of Portugal. It is now the centre of malaria studies for the whole country and courses of instruction are given to doctors, engineers and subordinate personnel. The paper also contains some general information regarding the prevalence of malaria in Portugal. *Norman White.*

ANDREWS (Justin), FAUST (Ernest Carroll) & WATSON (Robert Briggs). **Recent Advances in the Epidemiology of Malaria.**—*Southern Med. Jl.* 1940. Aug. Vol. 33. No. 8. pp. 883–887. [33 refs.]

FENG (Lan-Chou). **The Egg of *Anopheles* (*Myzomyia*) *pattoni* Christophers.**—*Chinese Med. Jl.* 1940. Mar. Supp. 3. pp. 300–303. With 5 figs. on 1 plate.

PIZZILLO (Giuseppe). Splenomegalia malarica tromboflebitica e adrenoterapia venosa. [**Malarial Splenomegaly and Venous Thrombosis treated with Intravenous Adrenalin.**]—*Riv. di Malariologia.* Sez. I. 1940. Vol. 19. No. 2. pp. 97–110. With 4 figs. [18 refs.] German summary (8 lines).

The author describes a case of malarial splenomegaly in which venous thrombosis developed. The patient when admitted to hospital was submitted to Ascoli's adrenalin treatment which, however, failed to effect any reduction in the size of the spleen. Towards the end of the course of treatment, after the 20th injection, the patient had a copious haematemesis followed by abundant melaena. Radioscopic examination failed to reveal any organic cause for this haemorrhage. Fifteen days later ascitic fluid began to accumulate. The patient though seriously ill returned home; he was readmitted to hospital some six weeks later. Splenectomy was performed; the patient died. The author states that the complete absence of splenic contraction in response to adrenalin treatment is an indication of the existence of phlebitic thrombosis and affords the possibility of timely surgical intervention; splenectomy is the only possible cure. *N. W.*

Pansini (G.), Caccuri (S.), Coppa (E.) & Parise (N.). Impiego di prodotti antimalarici e di metodi coadiuvanti. [**Use of Anti-malarial Preparations and of Accessory Methods.**]—*Riv. di Malariologia.* Sez. I. 1939. Vol. 18. Nos. 5 & 6. pp. 277–298; 337–360; and 1940. Vol. 19. Nos. 1 & 2. pp. 20–38; 69–96. With 17 graphs. English summary.

This series of papers relates in considerable detail the therapeutic results achieved by the administration of most of the usual, and some unusual, antimalarial remedies in the treatment of malaria patients invalided home from Italian East Africa to the Alessandro Mussolini Hospital in Aversa. Altogether the observations cover some 3,000 cases. Groups of patients were treated by different methods. One group received no specific treatment at all; some of these patients improved considerably, a fact which illustrates the beneficent action of time, change of climate, rest, good food and social care on the evolution of the disease. The methods of treatment used include Ascoli's method, quinine, atebrin, atebrin and quinine, atebrin and surrenasi, antimony tartrate intravenously according to de Nunno's method, M_3, "emopurina," and "Grego's potion." The last two appeared to have little, if any, therapeutic value. From the manner in which the results are presented it is not possible to assess the relative values of the various remedies. In general, the observations confirm accepted ideas as to their value and their limitations. The course of the disease was on the whole benign. *N. W.*

Yuge (Goro). Ueber das Verhalten der Retikulozyten bei Malaria Tropica im Kindesalter. Eine hämatologische Studie. [**Reticulocytosis in Subtertian Malaria in Children.**]—*Acta Japonica Med. Trop.* Formosa. 1940. Mar. Vol. 2. No. 1. pp. 191–199. With 1 fig.

To ascertain whether reticulocytes can be used as a criterion for the regenerative action of an antimalarial remedy, the author studied 11 children treated with atebrin and plasmoquine. He observed that a week's treatment induced a striking increase of the reticulocyte count and concluded that this indicated a regeneration process. At the same time he noted that the swelling of the liver and spleen reached a maximum prior to the appearance of the reticulocytosis, and will investigate this point further. *W. P. Kennedy.*

Cannistraci (Salvatore Carlo). Cura e profilassi della malaria con i preparati sintetici. [**Cure and Prophylaxis of Malaria with Synthetic Products.**]—*Riv. di Malariologia.* Sez. I. 1940. Vol. 19. No. 2. pp. 118–120. French summary.

In Messina the author treated 192 cases of malaria with atebrin, 0·3 gm. a day for 6 days, followed, after an interval of 2 days, by plasmoquine, 0·03 gm. a day for 4 days. A second course of treatment was given two months later. The results were good; there was no drug intolerance and no relapses. These drugs were also used as prophylactics; among 242 persons so treated there were only 3 cases of malaria as compared with 126 cases among 854 persons receiving quinine prophylactically. As a prophylactic, atebrin 0·3 gm., on one or two days a week, is recommended; children support this dose.

N. W.

CHOPRA (R. N.), HAYTER (R. T. M.), SEN (B.) & TALUKDAR (M.). **Crinodora (Palusan) in Indian Strains of Malaria.**—*Indian Med. Gaz.* 1940. Apr. Vol. 75. No. 4. pp. 202–204.

Crinodora, at first called Palusan, is atebrin prepared in Italy. Forty-four patients suffering from malaria in Calcutta were treated with this remedy. Three tablets, each containing 0·1 gm., were given by mouth three times a day for five days.

The drug behaves in exactly the same way as does atebrin.

N. W.

CHOPRA (R. N.), HAYTER (R. T. M.) & SEN (B.). **Haffkinine (Acriquine), an Atebrin-like Compound prepared in India, in Indian Strains of Malaria.**—*Indian Med. Gaz.* 1940. Apr. Vol. 75. No. 4. pp. 200–201.

An atebrin-like compound has been prepared at the Haffkine Institute at Bombay. The name haffkinine was at first given to this acridine derivative; it is now called acriquine. The authors of this paper report the results of treatment of eight cases of malaria with this preparation. The drug appears to act in identically the same manner, and with the same efficacy, as does atebrin. *N. W.*

BALLERO (Stefano). La terapia antimalarica col nuovo prodotto "Italchina." [**Treatment of Malaria with a New Product, "Italchina."**]—*Riv. di Malariologia.* Sez. I. 1940. Vol. 19. No. 2. pp. 111–117. French summary.

Italchina is a new acridine derivative. Unlike other acridine derivatives it causes no pigmentation of the skin. The results of treating 150 cases of malaria with this product, in Sassari, are recorded. Malaria is hyperendemic in Sassari. The cases were treated in August and September. In August, 45 cases were infected with *P. vivax*, 50 with *P. falciparum* and 8 with *P. malariae*; in 27 no parasites were found in the blood. The dose given was 0·30 gm. a day for 7 days. Control cases were treated with quinine, but the results are not recorded in a manner which enables the reader to compare the relative efficacy of the two drugs in different forms of infection. The author claims that Italchina is endowed with more potent therapeutic properties than are possessed by either quinine or other synthetic preparations. It is equally effective against all strains of infection; on the gametocytes of *P. falciparum*, however, its action is stated to be identical with that of quinine. Febrile relapses up to the end of the year occurred in 16·6 per cent. of cases. The action of the drug on clinical manifestations is prompt. Its action on the enlarged spleen is slower than that of other remedies but that action is more marked and more durable.

N. W.

SANDERS (J. P.) & DAWSON (W. T.). Observations sur la cure à la quinine des cinq jours dans le traitement du paludisme. [**Observations on the Five-Day Quinine Treatment of Malaria.**]—*Rev. du Paludisme et de Méd. Trop.* Paris. 1940. May 15. Vol. 2. No. 11. pp. 144–146.

See this *Bulletin*, 1940, Vol. 37, p. 185.

Federated Malay States. Annual Report of the Institute for Medical Research for the Year 1938.—[**Malaria** pp. 97–113. Field (J. W.).]

On a tea estate in an isolated tract of hilly country, inhabited by 700 Tamil immigrants, observations were made as to the value of plasmoquine as a prophylactic of malaria. Malaria is hyperendemic on this estate and due largely to *P. vivax*. Breeding of the vectors *A. umbrosus* and *A. novumbrosus* is uncontrolled. Plasmoquine was given to practically the whole population during nine months. Adults received 0·02 gm. twice a week. Children received smaller doses. In spite of the administration of plasmoquine malaria incidence remained high. Large numbers of *P. vivax* gametocyte carriers persisted. The incidence of infected wild-caught mosquitoes was approximately the same as during the previous year when only schizonticidal drugs were used for prophylaxis. Uninfected new arrivals and infants became infected within a few months of arrival or birth. Attempts to infect mosquitoes from *P. vivax* gametocyte carriers receiving plasmoquine were inconclusive : some gut infections were obtained but hitherto no gland infection.

An inquiry on a hilly rubber estate, with malaria of moderate endemicity, showed that 0·3 gm. of atebrin once a week is more effective in reducing the incidence of clinical malaria than is 0·3 gm. a day for five successive days every five weeks.

Forty-six cases of malaria were treated with Certuna. The cases were controlled in the careful manner which is characteristic of the work of this Institute. Doses varied from 0·03 gm. daily for five days to 0·06 gm. daily for 10 days. The drug has no action on the asexual forms of *P. falciparum* ; it has a destructive action on crescents similar to that of plasmoquine ; it has no effective action on either the asexual forms or the gametocytes of *P. vivax*. Certuna was well tolerated but in one case it may have been responsible for very severe toxic effects on the central nervous system.

Two preparations " Malarin " and " Malario " were both found to be of negligible value in the treatment of malaria. Prontosil is of small value in the practical treatment of malaria owing to its low efficiency and high cost. " A. Granulate," a new compound allied to atebrin, in the form of yellow granules of sweetish taste, especially intended for administration to children, was found to be less effective than atebrin in the treatment of acute malaria. *N. W.*

Clark (H. C.). **Review of Recent Research on Drug Prophylaxis and Treatment of Malaria : a Report to the National Malaria Committee.** —*Southern Med. Jl.* 1940. Aug. Vol. 33, No. 8. pp. 879–882. [32 refs.]

Schulemann (W.). Zur Pathologie der Malaria. [**The Pathology of Malaria.**]—*Deut. Med. Woch.* 1940. Mar. 8. Vol. 66. No. 10, pp. 253–256. With 1 fig. [23 refs.]

This is a résumé of work done in the last few years on the pigment-free parasites of bird malaria which are known as exo-erythrocytic forms. No new work is reported. The author shows a graphic schema in which the course of infection in birds isdemonstrated. Sporozoites enter the cells of the reticulo-endothelial system and undergo a

cycle of development during which the parasites are free from pigment. The merozoites resulting from this may again enter the R.E.S. and undergo the same cycle, or may enter the erythrocytes, in which case the ordinary pigmented forms are produced. Merozoites resulting from this cycle may continue the erythrocytic cycle, or may enter the R.E.S. to undergo the pigment-free exo-erythrocytic cycle, or may give rise to gametocytes. The work on which this paper is founded has been largely abstracted in this *Bulletin*. [References to exo-erythrocytic schizonts may be found in this *Bulletin*, 1939, Vol. 36, p. 279, and 1940, Vol. 37, pp. 247, 248.] *C. W.*

Kitchen (S. F.), Huff (Clay G.) & Roe (Maurice A.). **A Review of Recent Experimental Studies in Malaria.**—*Southern Med. Jl.* 1940. Aug. Vol. 33. No. 8. pp. 887–892. [90 refs.]

HELMINTHIASIS.

Précis of Abstracts in this Section.

General. Cameron (p. 38) reports on experiments into the possible means of eliminating animal parasites from manure. Over 100 chemicals were tested and the most useful was found to be urine, which when added to fresh faeces is capable of killing free-living sclerostome larvae.

Gunewardene (p. 38) shows that tetrachlorethylene can decompose to phosgene if exposed to light. Moreau (p. 38) describes a body, found in human faeces in Madagascar, which he regards as probably the egg of a worm. No adult has been found.

Yosino and Nakasato (p. 39) report on helminth infection in schoolchildren in the Okinawa Prefecture.

Trematodes.—Sabadini and Imbert (p. 39) have reported a new focus of urinary schistosomiasis in a coastal area of Algiers, which has hitherto been regarded as free from this infection. *Bulinus contortus* is present in the irrigation canals. Greig (p. 40) described a case of urinary schistosomiasis. L'Abbate (p. 40) reports urinary schistosomiasis probably acquired in the Lake Tana area.

Cawston (p. 40) notes that the pyrocatechin component of Fouadin is toxic.

Mohamed (p. 40) distinguishes between the bilharzial appendix, in which there are ova in the tissues with cellular reaction, and bilharzial appendicitis, in which bacteriological infections are superimposed. Symptoms resembling those of appendicitis may, in fact, be caused by bilharzial infection of the colon or urinary tract, and in this case cure may be obtained by anthelmintic treatment. Similarly, bilharzial infection of the gall bladder is not an isolated infection but is part of a general infection. The main infection is in the subserous tissues. Mild infections probably do not cause symptoms and for patients with signs of cholecystitis in the presence of bilharzia, drug treatment should be tried for some time before operation is undertaken. The ova probably do not become the nuclei of gallstones.

Brumpt (p. 41) describes the invasion of the tentacles of *Planorbis glabratus* by the miracidia of *Schistosoma mansoni*. The first signs of invasion are swellings on the tentacles. Development of primary

sporocysts and migration of daughter sporocysts take place more quickly at 25°C. than at 17°C. He points out that the eggs of *S. mansoni* do not open at once in a hypotonic medium, as do those of *S. haematobium*, and suggests that opening of the egg is effected by activity of the miracidium.

Martins (p. 42) regards a number of specific names in common use as synonyms of *Australorbis glabratus*. This snail is the intermediate host of *S. mansoni* in America.

Robertson (p. 42) reports endemic *S. japonicum* infection in W. Yunnan, and infected snails of the genus Katayama. Yao (p. 43) found eggs of *S. japonicum* in 106 of 191 stools examined in the Kwangsi province. Oncomelania from streams and irrigation ditches were found to harbour cercariae. Garcia *et al.* (p. 43) found eggs of *S. japonicum* in the tissues of a leg ulcer in a child in the Philippines.

Wu (p. 43) reports on the reservoir hosts of *S. japonicum* in China. Sheep, goats, dogs, cats, cattle, rats and horses have been found to be infected, and pigs, though not yet found infected in nature, are sensitive. These hosts must obviously be taken into account in considering prevention and control of human infection.

Cort *et al.* (p. 44) show that in N. Michigan the schistosome which causes dermatitis is *S. stagnicolae* and that the long life and characteristics of the seasonal cycle of the snail host *Stagnicola emarginata* are factors influencing the occurrence of this lesion. Brackett (p. 44) has studied schistosome dermatitis in Wisconsin and points out that the condition does not warrant the alarm sometimes aroused in the public. He (p. 44) has made observations on the behaviour of the cercariae which cause schistosome dermatitis.

Komiya and Tajimi (p. 44) discuss the structure of the cercaria of *Clonorchis sinensis* and record a new second intermediate host, *Squaliobarbus curriculus*, in the Shanghai area. Galliard *et al.* (p. 45) state that infection of the pancreas by *Clonorchis sinensis* is not rare in Japan, and describe two cases seen in Tonking. Both patients died and the pathological changes are described.

Kinugasa (p. 45) found infection with *Paragonimus westermanii* in 5·53 per cent. of children in Sintiku ; in some parts it was as high as 45·16 per cent. Most of the infections are due to eating raw crabs of the genus Potamon. Wu (p. 46) details the reservoir hosts and the snail hosts of Paragonimus in China. Crabs are eaten uncooked or slightly cooked, or after being immersed in wine which may not be enough to kill even the crabs. Crabs are sold as " cooked " or " drunken " crabs.

Wu (p. 46) discusses Paragonimus infection in leopards and tigers in China.

Yokogawa *et al.* (p. 47) show that in experiments on a few dogs infected with *Paragonimus westermanii*, treatment with intramuscular prontosil soluble (2·5 per cent.) and emetine brought about rapid and radical cure, whereas emetine alone was unsuccessful. The combined treatment was then given to 9 human patients. Of these 4 were apparently cured, 2 could not be followed up, 2 relapsed and 1 died of unrelated disease. The method is therefore worth further trial ; full details of dosage are given.

Wu (p. 48) mentions certain snail hosts of *Fasciolopsis buskii* which are not commonly known. Brumpt *et al.* (p. 48) have incriminated *Limnaea bogotensis* as a snail host of *Fasciola hepatica* in Colombia.

C. W.

Cameron (Thomas W. M.) **The Principles of Parasite Control.**—48 pp. With 3 figs. 1940. Gardenvale, Quebec: National Business Publications, Ltd. [In Canada 50 cents; in Great Britain 2*s.* 6*d.*]

This monograph deals with the principles of control of animal parasites as applied to veterinary practice.

Its subject matter is that of three lectures delivered under the auspices of the London University at the Royal Veterinary College in September 1938. It recalls that Maurice C. Hall stressed the need for investigation into the best means of eliminating animal parasitic elements from manure; that matter has been taken up in Hall's own department in the United States and at the Institute of Parasitology in Canada. At the latter over 100 chemicals have been tested with this aim and the most useful has been urine. Speaking generally, the addition to fresh faeces of a third of its weight of urine kills the free-living stages of sclerostomes. Urea in strength of 0·75 per cent., Calurea (an artificial fertilizer) in that of 1·25 per cent., and some other stated drugs are effective. The effects of heat, drought, light and ordinary agricultural procedures are noted, as are those of treatment and of reservoir hosts. It is emphasized that the application of principles must vary with conditions, and that the subject has no finish.

Clayton Lane.

Franck (H.) Die Bedeutung der Hautreaktion für die Diagnose von Darmparasiten. [**The Skin Reaction in the Diagnosis of Intestinal Parasites.**]—*Deut. Med. Woch.* 1940. Mar. 8. Vol. 66. No. 10. pp. 258–260.

Gunewardene (S. R.). **Decomposition of Tetrachlorethylene.**—*Jl. Ceylon Branch Brit. Med. Assoc.* 1940. Mar. Vol. 37. No. 1. pp. 47–48.

Tetrachlorethylene can decompose into phosgene if exposed to light. This paper is a sequel to the author's earlier paper [this *Bulletin*, 1939, Vol. 36, p. 832] in which he pointed out the serious symptoms which in Ceylon have followed administration of this drug and in which he mentioned phosgene as present in the bottles from which the drug was taken. Here investigation by J. V. Collins, the Government Analyst, of the conditions which favour this change, is reported. Bottles were exposed to light, were stored in a refrigerator or were stood in the dark; there was formation of phosgene in the first only of the three series. This impurity has been stated by Lamson to be no serious complication, but Gunewardene points out that phosgene is a dangerous lung irritant, so that to test for its presence by smell a deep breath should be taken and the test made by a gentle sniff, and if the presence of phosgene is detected, quick and complete expiration should be made. *C. L.*

Moreau (P.). Note au sujet d'un oeuf de configuration spéciale rencontré dans les selles à Madagascar. [**An Egg of Distinctive Shape in Stools in Madagascar.**]—*Bull. Soc. Path. Exot.* 1940. Apr. 10. Vol. 33. No. 4. pp. 295–296. With 2 figs.

A report from the clinical laboratory of the hospital at Fianarantsoa of what seem to be peculiar eggs found in the stools of 25 persons in a series of examinations over 2½ years.

Peculiar egg found in stools in Madagascar.
[Reproduced for the *Bulletin de la Société de Pathologie Exotique.*]

The body in question is nearly circular but having at one pole a triangular projection designated a " clapet " (lid or valve), its size is between that of an ascaris and a trichuris egg, and the persons who passed these bodies suffered from asthenia and intestinal troubles. Adult worms have not been found either on straining the stools or after using the duodenal sound. *C. L.*

Yosino (Takayosi) & Nakasato (Tyotei). **On the Prevalence of Intestinal Parasites among Primary School Children in Yaeyama County, Okinawa Prefecture.**—*Taiwan Igakkai Zassi* (*Jl. Med. Assoc. Formosa*). 1940. Aug. Vol. 39. No. 8. [In Japanese pp. 1162–1169. [10 refs.] English summary p. 1169.]

" The authors made a faecal examination of 1,765 primary school children (958 males and 807 females) in Yaeyama County, Okinawa Prefecture. The results of the examinations are shown in the following table " [of the non-infected 123 (12·84 per cent.) were males and 149 (18·46 per cent.) females] :—

	Number.	*Per cent.*
Non-infected	272	15·41
Infected	1,493	84·59
Hookworm	577	32·69
Strongyloides stercoralis ...	196	11·10
Ascaris lumbricoides	857	48·55
Trichocephalus trichiura ...	802	45·44
Enterobius vermicularis ...	39	2·21
Taenia solium	5	0·28
Hymenolepis nana	31	1·76
Hymenolepis diminuta	4	0·23

H. H. S.

Hoeppli (R.) & Ch'iang (I-hung). **The Origin of Human Helminths according to Old Chinese Medical Literature.**—Reprinted from *Monvmenta Serica.* Peiping. 1938. Vol. 3. No. 2. pp. 579–601. With 6 figs. [25 refs.]

Sabadini (L.) & Imbert (Marc). A propos d'une épidémie de bilharziose urinaire en Algérie. Remarques et déductions. [**An Epidemic of Urinary Bilharziasis in Algeria.**]—*Mém. Acad. de Chirurg.* 1940. Vol. 66. No. 1–2. pp. 14–19.

Though the Algerian littoral has hitherto been free from urinary schistosomiasis, an epidemic of this, recognized by the presence of

eggs, is here reported from Saint-Aimé (Department of Algiers) in Europeans and natives.

It is true that at the oasis of Djanet, some 800 miles away across the Sahara, this infection has been reported [RAYNAUD, this *Bulletin*, 1927, Vol. 24, p. 515; and 1936, Vol. 33, p. 10] and that it is present in Morocco, but hitherto coastal Algeria has been held free from indigenous infection. *Bulinus contortus* is scattered over its irrigation canals. Cystoscopic examination of 120 Senegalese soldiers, all strong and healthy looking, is said to have shown lesions in 80 per cent., though they had no haematuria and no symptoms. *C. L.*

GREIG (E. D. W.). **Case of Urinary Bilharziasis showing Marked Anaemia and Resistance to Antimony Treatment.**—*Jl. Trop. Med. & Hyg.* 1940. Sept. 2. Vol. 43. No. 17. pp. 227–229.

This patient had had about a dozen intravenous antimony injections for recurrent attacks of haematuria.

He came into the Royal Infirmary, Edinburgh, with the history that he became ill after bathing at Victoria Falls, S. Africa, and that bilharzia ova had then been found in the urine. He was very pale, red cells 2,700,000, haemoglobin 40 per cent., eosinophils 4 per cent., no bilharzia ova. The treatment was by intramuscular fouadin injections to a total of 40 cc. in 15 days, and ferrous sulphate and liquor arsenicalis by mouth. The case is discussed but it is too early yet to assess the result of treatment. *C. L.*

L'ABBATE (G.). Contributo allo studio della distribuzione geografica della bilarziosi vescicale. [**The Distribution of Vesical Schistosomiasis.**]—*Rass. Sanitaria dell' A.O.I.* Addis Ababa. 1939. Sept. 9. Vol. 1. No. 3. pp. 43–45.

Report of urinary bilharziasis with many eggs in the urine in a man seen in Gondar and coming from northern Goggiam. It was probably acquired from the water of Lake Tana or its affluents.

C. L.

GELFAND (Michael) & DAVIS (G. B.). **Bilharzial Lesions of the Testis.**—*South African Med. Jl.* 1940. Sept. 14. Vol. 14. No. 17. pp. 334–335.

CAWSTON (F. Gordon). **Fouadin in Bilharziasis.** [Correspondence.]—*Lancet.* 1940. June 29. p. 1178.

Cawston notes that the difficulty of giving an adequate dose of antimony in fouadin lies in the toxic action of its pyrocatechin: perhaps in anthiomaline the arsenic is present in a combination that allows of a smaller dose, at least with infections by *S. haematobium* alone. *C. L.*

i. MOHAMED (Abdel Shafi). **Bilharziasis and its Relation to Appendicitis.**—*Jl. Egyptian Med. Assoc.* 1940. Jan. Vol. 23. No. 1. pp. 1–30. With 2 figs. [21 refs.]

ii.——. **The Rôle of Bilharziasis in the Production of Cholecystitis.**—*Ibid.* Mar. No. 3. pp. 116–139. With 3 figs.

i. It is insisted that bilharziasis of the appendix is part of a wider infection and that there must be a clear distinction between the bilharzial appendix (in which there are numbers of ova in the tissues

with infiltration by active cells of the reticulo-endothelial system, or, as the author puts it, with histiocytes, giant cells, eosinophil cells, lymphocytes, fibroblasts and connective tissue fibres) and bilharzial appendicitis (in which bacterial infections are superimposed with their characteristic histological reactions).

The material on which comment is made consists of records of 12 autopsies; in none of them was the fluke infection confined to the appendix and in most that infection was severe either in the intestinal or in the urinary tract or in both. On the other hand appendices were normal in 17 per cent. of 206 removed by operation at the Kasr El Aini Hospital, and the appendicular symptoms are ascribed to the results of infection of the colon or urinary tract or both, so that permanent cure could have been got by antimony or other anthelmintic treatment after the presence of bilharzia infection had been proved by ova in the faeces of urine or suggested by eosinophilia.

ii. Again there is insistence that bilharzial infection of the gall bladder does not occur in an isolated or primary form, that bacterial infection with inflammation is a secondary infection, and that the proper treatment of the worm infection is by drugs. From the autopsy records are collected 10 cases of bilharzial infection of the gall bladder, and in all there was infection elsewhere; three more are added in which this organ escaped infection, though this was present in the surrounding viscera. In 8 of the 10 cases the livers were infected, all but one showing bilharzial cirrhosis and splenomegaly, while in 9 of the 10 there were ova in the colon wall. Of 13 bilharzial gall bladders examined, there were ova on the submucosa and in one or both of the muscular and subserous coats. In general, the distribution is of the kind present in other hollow viscera, but it is apt to show fewer ova with their main concentration in the subserous coat. It is held questionable whether mild degrees of infection give rise to symptoms. At operations for chronic cholecystitis 21·9 per cent. of normal gall bladders have been removed, so that when investigations point to any bilharzial infection the patient should be given the chance of medical treatment for 2 or 3 months, a procedure which it is believed would give most of them a permanent cure. It is not thought that the ova may become nuclei for gallstones. *C. L.*

Brumpt (E.). Confirmation des observations de A. Lutz sur les lésions tentaculaires de *Planorbis glabratus* (= *P. guadeloupensis*) déterminées par l'évolution sur place des miracidies de *Schistosoma mansoni*. [**Confirmation of Lutz's Observations that Lesions in the Tentacles of** *P. glabratus* **are determined by the Development in situ of Miracidia of** *S. mansoni*.]—*C. R. Soc. Biol.* 1940. Vol. 133. No. 4. pp. 625–628. With 1 fig.

These lesions, described by Lutz in 1919, and apparently by no one else since, are substantiated and described.

The snails were infected in a Petri dish at 27°C. to 30°C. in water which contained eggs of *S. mansoni*. The miracidia probably penetrate all parts of the molluscan body, as well as the tentacles and foot where Brumpt found them. About the fourth day of infection, in infected tentacles cut off and examined between slide and cover, there are oval parasites measuring 100μ by 70μ without cilia but with active flame cells, the primary sporocysts. On the 7th to 8th day at 17°C. (but sooner at 25°C.) the tentacles show white lumps standing out on the

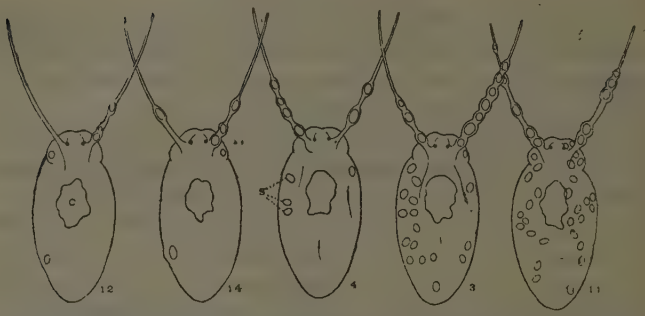

Figure showing from left to right the effects of the entry of increasing numbers of miracidia 16 days after infection. Primary sporocysts lying in the tentacles are producing secondary sporocysts which are on the point of migrating into the visceral mass of the mollusc

[Reproduced for the *Comptes Rendus de la Société de Biologie.*]

red background, these primary sporocysts now measuring 300μ to 500μ, and growing till the 20th day when they reach a diameter of 1500μ and contain up to 250 daughter cysts, this high figure being perhaps the products of several miracidia. At a temperature of 25°C. the daughter cysts start migration to the hepato-pancreatic gland, grow there and set free cercariae in the 6th week. From one stock of *P. glabratus* in Caracas, Brumpt obtained these tentacular swellings in nearly all snails, and in 14 of 16 snails there were primary sporocysts in the foot. The eggs of *S. mansoni* do not, as do those of *S. haematobium*, open at once in a hypotonic medium ; perhaps it is a miracidial activity that effects hatching. *C. L.*

MARTINS (A. Viana). Contribuição ao estudo do gênero Australorbis Pilsbry, 1934. [**Contribution to the Study of the Genus** *Australorbis.*] —*Mem. Inst. Biol. Ezequiel Dias.* 1938. Vol. 2. pp. 5–61. With 6 plates (1 coloured). [58 refs.]

It is held that the intermediate host of *S. mansoni* in America is *Australorbis glabratus* (Say, 1818) Pilsbry, 1934, and that the names *Planorbis guadaloupensis* Sowerby, 1821, *P. olivaceus* Spix, 1827, *P. nigricans* Spix, 1827, *P. immunis* Lutz, 1918, *P. centrimetralis* Lutz, 1918, and perhaps *P. peregrinus* d'Orbigny, 1847, are synonyms given to members of a variable species. *C. L.*

ROBERTSON (R. Cecil). **Schistosomiasis in the Tali-Fu Region of Yunnan Province.**—*Chinese Med. Jl.* 1940. Apr. Vol. 57. No. 4. pp. 358–363. With 2 figs. on 1 plate. [16 refs.]

The author, who is Professor of Pathology, Hongkong University, and Chief Technical Expert, League of Nations Epidemic Commission, reports endemic infection with *S. japonicum* in Tali-fu and Fengih district including the Hsiakwan region on the West Yunnan plain. Infected snails, undoubtedly belonging to the *Katayama* group, were found in irrigation ditches in October 1939. *C. L.*

YAO (Y. T.). **Schistosomiasis in the Pingyang District, Kwangsi.**—*Far Eastern Assoc. Trop. Med. C.-R. Dixième Congrès Hanoi, 26 Nov.–2 Dec., 1938.* Vol. 2. pp. 727–739. With 6 figs. on 2 plates. [17 refs.]

In a village of the Pingyang District, Kwangsi Province, many of the inhabitants were observed to have protuberant abdomens and investigations showed that the condition had been known to exist there for more than half a century. About half the families were attacked, both sexes, males more than females, and death usually occurred within 10, perhaps within 5, years of the abdominal enlargement becoming obvious. Further investigations revealed that the condition was a schistosomiasis, due to *Sch. japonicum* ; of 191 stools taken at random for examination 106 (55·5 per cent.) contained the characteristic ova. Oncomelania (not *nosophora* nor *hupensis*) were collected from streams and irrigation ditches in the village and 7·8 per cent. (72 out of 916) harboured the cercariae and these infected experimental rabbits. *H. H. S.*

GARCIA (Eusebio Y.), NAVARRO (Regino J.) & BAUTISTA (Laureano). **A Case of Cutaneous Schistosomiasis involving** *Schistosoma japonicum* **Eggs.**—*Acta Med. Philippina.* Manila. 1940. Jan.–Mar. Vol. 1. No. 3. pp. 339–345. With 6 figs. on 3 plates.

A child of 10 suffered from a chronic ulcer of the leg, biopsy showed eggs of *S. japonicum* under the epithelium. She also had dysenteric symptoms with eggs of this parasite as well as of ascaris and trichuris in the faeces. *C. L.*

WU (Kuang). **Schistosomiasis japonica among Sheep and Goats, with a Review of the Reservoir Hosts from China.**—*Far Eastern Assoc. Trop. Med. C.-R. Dixième Congrès Hanoi, 26 Nov.–2 Dec., 1938.* Vol. 2. pp. 721–725. [10 refs.]

Between March and June 1937 the author examined portions of the livers of 355 sheep from Shanghai municipal abattoirs and found *Sch. japonicum* infection in six (1·7 per cent.), whereas among 196 goat livers there were 16, or 8·1 per cent. This does not necessarily mean that goats are more susceptible than sheep ; the goats may have been brought to Shanghai from a region of greater endemicity. In the lower Yangtze delta faeces of sheep and goats are used for fertilizer, hence the risk of human infection.

FAUST and MELENEY [this *Bulletin*, 1925, Vol. 22, p. 468] in their authoritative monograph found that dogs, cats and imported cattle were reservoir hosts in China, and stated that native oxen were reported to be immune, and thought that man alone was the important definitive host. The author has by his studies shown this to be erroneous. He found infection in a house rat and thinks that there may be a high incidence among field rats in endemic centres ; it has been reported in dogs in Hunan, Kiangsu and Chekiang and particularly among hunting dogs which enjoy aquatic life. Examination of 55 cats in villages in Chekiang showed six (9 per cent.) to be harbouring *Sch. japonicum*. In oxen the author has found it in percentages ranging between 0·8 and 34·4, with an average of 12·6, and in buffaloes 8·3 and 24·2, with an average of 18·7. Pigs he has not yet found naturally infected but experimentally they were sensitive. Four of 13 horses whose livers were examined in 1938 were found to be infected.

Clearly, then, animals other than man are potential hosts of *Sch. japonicum* and the control and prevention of infection in man or animals must take account of these reservoir hosts. *H. H. S.*

CORT (W. W.), MCMULLEN (D. B.), OLIVIER (Louis) & BRACKETT (Sterling). **Recent Studies on Schistosome Dermatitis in the United States.**—*Rev. Med. Trop. y Parasit.* Habana. 1940. Mar.–Apr. Vol. 6. No. 2. pp. 55–64. [23 refs.]

Investigation on the cercariae that cause this dermatitis locally shows that

" . . . . in the Douglas Lake region of northern Michigan the short life span of *Physa parkeri* seems to be the chief factor that prevents its schistosome, *C. physellae*, from being a significant factor in the production of human dermatitis. On the other hand the longer life of the adults of *Stagnicola emarginata* and the characteristics of the seasonal cycle of its infection with *C. stagnicolae* make this schistosome cercaria the important etiological agent of ' swimmer's itch ' on the bathing beaches and determines to a considerable extent the time at which the outbreaks occur."

BRACKETT (Sterling). **Studies on Schistosome Dermatitis. V. Prevalence in Wisconsin.**—*Amer. Jl. Hyg.* 1940. May. Vol. 31. No. 3. Sect. D. pp. 49–63. With 1 map. [19 refs.]

Exaggerated ideas have gained ground as to the prevalence of schistosome dermatitis in Wisconsin.

These outbreaks were most extensive in 1937, but questioning showed that few persons had up till then been infected in any particular locality. Since the cause was practically unknown, the afflicted became scared, and since it happened that the outbreaks occurred at times when many were using bathing beaches, some of these got a bad name. In the next two years there was practically no dermatitis and the snail hosts, though widespread, were lightly or not at all infected with larval schistosomes ; but in view of the still largely unknown conditions that favour their infection, more and severer outbreaks of the dermatitis may occur there. If so a knowledge of their cause need produce no more anxiety among the infected than would the mosquito bites that so constantly occur among people locally. *C. L.*

BRACKETT (Sterling). **Studies on Schistosome Dermatitis. VI. Notes on the Behavior of Schistosome Cercariae.**—*Amer. Jl. Hyg.* 1940. May. Vol. 31. No. 3. Sect. D. pp. 64–73. [10 refs.]

The cercariae that produce dermatitis may be identified by their behaviour. Using this test it was found that emergence of these cercariae from snails followed a sudden rise in temperature or the feeding of their hosts after starvation. Again they cling to water plants, and contact with these may transfer them to men's skin. Further, they are attracted to light so that they are found on the surface in numbers on warm, sunny, still days only [which presumably are just those on which bathing beaches are most popular]. *C. L.*

KOMIYA (Yoshitaka) & TAJIMI (Tai). **Study on *Clonorchis sinensis* in the District of Shanghai. 5. The Cercaria and Metacercaria of *Clonorchis sinensis* with Special Reference to their Excretory System.**—Reprinted from *Jl. Shanghai Sci. Inst.* 1940. Feb. Sect. 4. Vol. 5. pp. 91–106. With 11 figs. on 7 plates. [21 refs.]

" The body structure of the cercaria and metacercaria of *Clonorchis sinensis*, particularly of their excretory system is described. The

flame cell pattern of the cercaria and the metacercaria is shown to be $2\times[(3+3)+(3+3+3)]$. The development of the metacercaria of *Clonorchis sinensis* is traced experimentally." From these data the authors "conclude that FAUST and others identified at least two different species of metacercariae, namely those of *Exorchis oviformis* and *Metagonimus* sp. as that of *Clonorchis sinensis*." "*Bithynia striatulus* (Benson) is confirmed as the first intermediate host of *Clonorchis sinensis* in the Shanghai area. Two further second intermediate hosts of *Clonorchis sinensis* are confirmed in this area, namely: *Leucogobio polytaenia* and *Squaliobarbus curriculus*. The former has already been reported by HSÜ and KHAW as such in the Peiping area, while the latter has never previously been described as such, here and elsewhere." *C. L.*

YOSHINO (Keizo). Untersuchungen ueber die enzystierten Zerkarien von Trematoden mit besonderer Berücksichtigung der jahrzeitlichen Veränderungen in *Carassius auratus* (Linnaeus). [**Investigations on Encysted Cercariae of Trematodes with Special Reference to Seasonal Alterations in** *C. auratus*.]—*Okayama-Igakkai-Zassi* (*Mitt. d. Med. Gesellsch. z. Okayama*). 1940. Feb. Vol. 52. No. 2. [In Japanese pp. 274–306. German summary pp. 307–308.]

GALLIARD (Henri), DANG-VAN-NGU & PHAN-HUY-QUAT. La distomatose pancréatique à *Clonorchis sinensis* au Tonkin. Etude anatomo-pathologique. [*Clonorchis sinensis* **in the Pancreas of Tonkingese Subjects.**]—*Far Eastern Assoc. Trop. Med. C.-R. Dixième Congrès Hanoi, 26 Nov.–2 Dec., 1938.* Vol. 2. pp. 659–668. With 6 figs. on 3 plates. [15 refs.]

Two cases are recorded, and according to the authors two had previously been observed in Tonking. *Clonorchis sinensis* invasion of the pancreas is not by any means rare in Japan; KATSURADA found it in 11·8 per cent. of cases of infection. The two here described were men aged 39 and 40 years, complaining of acute abdominal pain and oedema, diarrhoea in one, jaundice in the other patient. General asthenia progressed and both died. The notable pathological changes in the pancreas were dilatation of the ducts and canals, connective tissue reaction, atrophy of the gland tissue with proliferation of epithelial layers like new gland formation. In one case there was marked capillary congestion and blood sinuses round the canals, in other words sclerosis round the hypertrophied or dilated ducts and new gland-tissue formation. Later, the sclerosis increases and causes atrophy of the gland tissue; inflammatory reaction, congestion of vessels and local eosinophilia are marked. *H. H. S.*

KINUGASA (Masaru). **Investigation on the Incidence of Lung Fluke Disease** (*Paragonimus Westermanii*) **in Sintiku Prefecture. III. On its Incidence in the Children of Ttaining Places for Aborigines in Sintiku Prefecture.**—*Taiwan Igakkai Zassi* (*Jl. Med. Assoc. Formosa*). 1940. Feb. Vol. 39. No. 2. [In Japanese pp. 227–235. English summary pp. 235–236.]

Examination of 1,735 children of the aboriginal Takasago race showed lung fluke infection in 5·53 per cent.

The highest infections were in girls, and the highest age period was 10 or 11. In different places the infection rate varied from 0·72 to 45·16. Most infections, it is believed, are due to the eating of *Potamon*

rathboni and *P. dehaanii*, for these are caught near villages and are eaten raw, whereas the large *Eriocheir japonicus* is first boiled.

C. L.

Wu (Kuang). **The Epidemiology of Paragonimiasis in China.**—*Far Eastern Assoc. Trop. Med. C.-R. Dixième Congrès Hanoi, 26 Nov.–2 Dec., 1938.* Vol. 2. pp. 689–713. With 1 diagram, 3 plans, 6 figs. & 1 map. [44 refs.]

Human paragonimiasis is met with in China in the Provinces of Chekiang, Hupeh, Hunan, Yunan and Liaoning, and perhaps in Fukien, Anhwei and Kwangtung; in reservoir hosts—rat and dog in Kwangtung; cat, wild cat and leopard in Chekiang, leopard and tiger in Fukien. The snail hosts are *Melania libertina* and *Assiminea lutea*, and the crab hosts *Potamon denticulatus, Parathelphusa sinensis, Sesarma dehaani* and *S. sinensis*. *Eriocheir sinensis* regarded as one of the secondary intermediate hosts, was not found infected, but the author did not examine very many of them. Melania and Potamon live in mountain streams, Assiminea and Sesarma in delta regions.

Eating of crabs by the Chinese dates back almost certainly for 3,000 years (the Chow dynasty, B.C.1115) and is common to-day. The dish may be well or slightly cooked, or uncooked; more often the two former, in Shaoshing the last. By some the crabs are merely immersed in wine of varied alcoholic strength. In diluted millet wine (10 per cent. alcohol) or in rice wine (14 per cent.) the encysted metacercariae are viable up to 43 and 18 hours respectively at room temperature (22°C.). In Shaoshing even lower strengths are used and the liquor may not cover the crabs, and the fluid is left in contact for 12 hours or less, so that the cysts and crabs are still living and this habit of devouring "drunken crabs" is prevalent, in fact the dish is sold in the restaurants either "cooked" or "drunken."

H. H. S.

Wu (Kuang). **Paragonimus among Leopards and Tigers in China.**—Reprinted from *Peking Natural History Bull.* 1938–39. Vol. 13. Pt. 4. pp. 231–245. With 5 figs. & 3 plates. [21 refs.] [Henry Lester Institute of Medical Research Collected Papers 1939. Vol. 7. No. 41.]

"1. A relatively high incidence of *Paragonimus* infection is found to exist among the leopard and the tiger in China, both being for the first time reported in this country. It is quite probable that the disease may be indigenous to Fukien Province.

"2. Anatomical differences have not been noticed between the adult lung flukes from six Chinese leopards and one tiger and those of other animals described from North America or other Asiatic countries.

"3. In the present study the shape, size and arrangement of the cuticular spines of *Paragonimus* are found to be very variable in individual specimens, so they are inadequate as a basis for distinguishing the species. The shape and size of *Paragonimus* eggs are also found to be very variable, and cannot be said to have any specific differences.

"4. An epidermoid *Paragonimus* cyst with possible early carcinomatous changes was found in the lung of a tiger from Fukien."

i. Yokogawa (Sadamu) & Ro (Mantoku). **Studies on the Treatment of Paragonimiasis. Part I. Experimental Treatment and Efficacy on Dogs harbouring Lung Flukes** (*Paragonimus westermanii*).—*Acta Japonica Med. Trop.* Formosa. 1939. May. Vol. 1. No. 1. pp. 1–18. [23 refs.]

ii. ——, ——, Wakisaka (Kenji) & So (Kinza). **Studies on the Treatment of Paragonimiasis. Part II. On the Efficacy of Prontosil in Combination with Emetine against Lung Fluke Disease and Changes in the Eggs of Lung Flukes during the Treatment.**—*Ibid.* 1940. Mar. Vol. 2. No. 1. pp. 23–54. With 32 figs. on 2 plates. [13 refs.]

iii. ——, ——, —— & ——. **Studies on the Treatment of Paragonimiasis. Part 2. On the Efficacy of Prontosil in Combination with Emetine against Lung Fluke Disease and Changes in the Eggs of Lung Flukes during the Treatment.**—*Taiwan Igakkai Zassi* (*Jl. Med. Assoc. Formosa*). 1940. Feb. Vol. 39. No. 2. [In Japanese pp. 164–179. English summary pp. 180–181. With 32 figs. on 2 plates.]

i. For the treatment of Paragonimus infection induced in three dogs, the authors used intramuscular injections of prontosil soluble, in strength of 2·5 per cent., with emetine hydrochloride, and found that it brought about rapid and radical cure.

The effects of successful treatment were that the oval eggs became globular, the shells thin and irregular with faded colour, though when they aggregated the colour was reported as deep brown, the contents became fluid, with deposit of fat, granules and vacuoles. Later the eggs disappeared from the sputum; in dog 1 examined shortly after this, the worms, dead and degenerate, were found in the cysts; in dog 2, examined 20 days after the eggs disappeared no worms were found, there being only atrophied, cicatrized and calcified cysts; in dog 3 the treatment was twice stopped owing to the onset of debility, and on its being given for the third time the dog died of debility and its lungs then contained eleven living and seven dead worms, as well as 22 worm cysts of which 8 were empty. Ill effects are held to be due to emetine.

Control dogs were given emetine alone; one showed no decrease in egg numbers in the sputum, in the second and third at autopsy the numbers of worm cysts, of living and of dead worms were 17, 23 and 3 in one and 14, 22 and (?) 2 in the other. The dosage causing disappearance of eggs was—for dog 1, weighing 17·7 kilos., of prontosil 37·4 cc. and of emetine 0·145 gm.; for dog 2, weighing 19·5 kilos., of prontosil 28 cc. and of emetine 0·13 gm.; in dog 1 the total quantities were—of prontosil 37·4 cc. and of emetine 0·145 gm., and in dog 2 were 28 and 0·128. In dog 3, weighing at first 17·28 kilos., the quantities given at the three courses of treatment were—of prontosil 37·4, 44·8 and 36 cc. and of emetine 0·145, 0·179 and 0·192 gm.

ii. The experience obtained on three dogs has been used for the treatment of nine human patients.

The treatment was by intramuscular prontosil, 2·5 per cent., to a total of 60 to 165 cc., and intravenous emetine hydrochloride, 4 per cent., to a total of 12 to 23·5 cc., over a period of 7–17 days. In six patients treatment was continued till eggs, after a temporary increase in number during the first four days, disappeared from the sputum; in three it was stopped when degenerative changes

in the eggs became conspicuous, but in these the eggs decreased in numbers and finally were no longer found. When this degeneration has begun on the third day treatment has proved successful; when, after beginning on the fifth or sixth day, it becomes conspicuous only after 2 weeks, there is fear of relapse. The sputum decreases steadily, haemoptysis ceases in 2 to 18 days and the rusty colour gives place to mucus. Of the 9 patients, 2 could not be followed up, 4 had no recurrence of symptoms five months later, 1 died of unrelated disease, and 2 relapsed with much haemoptysis, a condition the authors attribute to invasion of the lung. The blood showed eosinophilia in 7, anaemia in 4, and increased sedimentation rate in 7; treatment caused no alterations in the blood except for an unspecified change in the sedimentation rate in 2. [The temporary disappearance of eggs in some cases suggests an early toxic effect on the ovary as in Dirofilaria.]

iii. This is a Japanese version of the work described in ii, with an English summary. [Once more it may be pointed out that had an English description of the excellent figures been given, the value of this summary would have been greatly enhanced.] *C. L.*

Wu (Kuang). **Some Aspects of** *Fasciolopsis buskii.*—*Far Eastern Assoc. Trop. Med. C.-R. Dixième Congrès Hanoi, 26 Nov.–2 Dec., 1938.* Vol. 2. pp. 671–684. With 5 figs. on plates (1 map).

A useful paper showing the distribution of *Fasciolopsis buskii* in man in China (see map), together with a list of the intermediate snail hosts and the aquatic plants on which they occur. The intermediate hosts mentioned are: *Planorbis schmackeri, P. coenosus, Segmentina nitidellus, S. calathus, S. largillierti, Hippeutes cantori,* and *Cyraulus saigonensis.* The fourth and the last two are not mentioned in the latest text-books, while *S. hemisphaerula* mentioned in the latter is not given in the author's list. *H. H. S.*

Brumpt (E.), Velasquez (J.), Ucroz (H.) & Brumpt (L. Ch.). Découverte de l'hôte intermédiaire, *Limnaea bogotensis* Pilsbry, de la grande douve, *Fasciola hepatica,* en Colombie. [*L. bogotensis* **as Intermediate Host of** *F. hepatica* **in Colombia.**]—*Ann. Parasit. Humaine et Comparée.* 1939–1940. Vol. 17. No. 6. pp. 563–579. With 1 fig. & 1 plate. [58 refs.]

Limnaea bogotensis has to be added to the 15 snail hosts already known in nature and to the 5 that have been infected experimentally. This new host has been implicated in the savanna of Bogotá in Colombia at a height of 2,600 metres to the extent of 2 among 122 dissected. *C. L.*

YAWS AND SYPHILIS.

Précis of Abstracts in this Section.

Pardo-Castello (p. 49) shows that in Cuba yaws is relatively more common in the negroes than in the whites, and that it is largely found in rural family groups. Clinically there are found ulcerative

primary lesions (suggesting bacterial infection), gangosa, persistent early lesions and bone changes, but the author does not mention juxta-articular nodules or goundou. The clinical picture in the early stages of yaws, but not in the late stages, in no way resembles that of syphilis.

Takahashi and Asai (p. 50) give an account of yaws in the natives describing the lesions commonly found. With Chin (p. 51) they show that relapse occurred in a number of patients with florid yaws in spite of full salvarsan treatment. In many the Wassermann reaction remained positive and there was no relationship between the intensity of treatment and the development of the reaction.

Hermans (p. 52) describes the forms taken by plantar and palmar yaws. Soetopo and Goenawan (p. 52) discuss leprosy-like infiltrations occurring in yaws. Oomen (p. 52) discusses the nasal lesion of tertiary yaws. They are most common in young adults, and a very full description, which cannot be further abstracted, is given. So long as the inflammatory process is active it is susceptible to treatment with salvarsan preparations and the author emphasizes that this treatment should be given and that even a few injections may suffice to check the spread and prevent serious results. Sinnadurai (p. 53) reports gangosa in a native of Malaya who denies having had secondary yaws and who has no sign of leprosy, tuberculosis, blastomycosis, dermal leishmaniasis or late syphilis. The Wassermann reaction is not recorded. Although gangosa is always found in areas where yaws is endemic, some other factor may be concerned in the aetiology. d'Ignazio and Del Campo (p. 54) describe the course of a case of gangosa.

Navarro and Gomez (p. 54) describe in detail a simple serological test for yaws and syphilis, the results of which agree closely with those of the Kahn and Wassermann tests. The procedure cannot be further abstracted. Foley (p. 56) reports positive Wassermann reactions in a considerable proportion of a group of native inmates of a mental hospital in Tanganyika Territory.

Hoff and Shaby (p. 56) describe three cases, in Bedouin Arabs, in which a diagnosis of syphilis of the central nervous system was made. They state that many cases of meningovascular syphilis are seen in the Bedouin Arabs and argue that if the type of syphilis from which they suffer is that known as bejel, then this form can give rise to manifestations of meningovascular involvement.

Monacelli and Pisani (p. 57) describe the cases of three brothers, all children, in whom signs of amyotrophic lateral sclerosis were associated with juxta-articular nodules. It is concluded that both the nervous lesions and the nodules were manifestations of hereditary syphilis. *C. W.*

Pardo-Castello (V.). **Yaws. Five Hundred Cases observed in Cuba.**—*Arch. Dermat. & Syph.* 1939. Nov. Vol. 40. No. 5. pp. 762–773. With 7 figs.

Though yaws has been recognized as occurring in all the islands of the Caribbean Sea, Cuba, until a few years ago, was generally supposed to be free. In 1932 the author reported for the first time the occurrence of yaws in three white children of well-to-do parents in the province of Oriente.

In 1937 a Commission of Enquiry into yaws was appointed. Cuba has an area of 12½ thousand square miles with a population of 651,695 whites and 461,350 negroes. The Commission found evidence that the disease had existed in the island for at least 40 years. It was thought that the affection had been introduced by labourers from Haiti and Jamaica. The greater proportion of the cases were found in Oriente and totalled 227 whites: 274 negroes—in a population which was about 40 per cent. negro. These cases were to a very large extent distributed in the rural population, which lives in small isolated family groups in the mountainous regions, a fact which is taken to account for the non-spread of the disease.

The clinical descriptions resemble those of the disease anywhere else and need little comment. The author refers to ulcerative primary lesions as well as granulomatous, suggesting that secondary bacterial infection is common. He mentions as seen (but no figures given) lesions of the septum nasi, tonsil, "soft and hard palate and of the pillars following a rapid and destructive course" going on to gangosa [*i.e.* lesions associated with gangosa rather than secondary lesions of mucous membranes]. He observed the well-known phenomenon of early lesions persisting for years and undergoing changes with mutation to a "tertiary" type of lesion. Bone lesions including sabre tibia are common, but there is no mention of J.A.N., nor of goundou. No cases of nervous disease and no case of aortitis due to yaws are noted. In 25 cases [stage of disease, which is important, not mentioned] the c.s.f. was examined: in 13 there was an excessive value for globulin; in 3 pleocytosis with a maximum of 11 lymphocytes; in 6 the Kahn test was positive; in 13 the Lange gold curve was a syphilitic curve [results much resembling those of other observers].

The author agrees with other framboesiologists in stating that while late ulcerative (gummatous) lesions cannot be differentiated from those due to syphilis the clinical picture in the earlier case of yaws in no way resembles the latter disease.

[It would be very interesting to know more definitely the history of yaws in Cuba. As the facts stand it would seem possible that the disease was of ancient standing and that what is seen now is "all that remains."] *H. S. Stannus.*

TAKAHASHI (Shinkichi) & ASAI (Tōru). Ueber Framboesia tropica in Formosa. Vorläufige Mitteilung. [**Yaws in Formosa.**]—*Acta Japonica Med. Trop.* Formosa. 1939. May. Vol. 1. No. 1. pp. 57–77. With 17 figs. [10 refs.]

That yaws is endemic in the southern part of Formosa has been known for many years but it has only on two occasions been the subject of any communications. The authors have therefore set out their findings concerning this disease as observed in the three southern provinces of that island in considerable detail, with a number of excellent photographs of a number of the conditions they describe.

The total number of cases studied was ninety-seven. Tables showing sex and age incidence, stage of disease, distribution of initial lesion and other types of lesion are given as also some tables referring to treatment.

Speaking generally, the picture of yaws here presented differs in no way from that in any other endemic area.

The following points may be noted: the disease occurs among the primitive poorly nourished Paiwan peoples living at anything up to 1,000 feet above sea-level, an indigenous folk also subject to endemic goitre. Males are more frequently affected than females in a proportion of 5 : 3. Sexual intercourse seldom if ever plays a part. The primary lesion tends most frequently to be on the leg. The hairy scalp is never involved. There is no loss of hair. A spoon-shaped deformity of the nails was not uncommon among the patients. Various lesions of mucous membranes are mentioned such as leucoplakia of tongue, oedema of tonsil, and linear lesions on the gums, but these were, the authors believe, due to over indulgence in tobacco; these lesions were spirochaete negative in contradistinction to those about the lips, which were positive.

Keratitis, conjunctivitis and iritis were also noted in a few cases but there was no evidence that these were framboesial in nature. There was no evidence of involvement of the central nervous system. The femoral glands were commonly enlarged but no generalized adenopathy was noted. In three children bowing of the tibia was observed, but no cases of joint affection nor of gangosa were seen. Juxta-articular nodules are not mentioned. *H. S. S.*

Takahashi (Shinkichi), Asai (Toru) & Chin (Toka). Ueber Framboesia tropica in Formosa. I. Mitteilung. Ueber serologische Studien bei Framboetikern aus Rikiriki und den benachbarten Eingeborenenkolonien. [**Yaws in Formosa, Serological Studies in Rikiriki and Adjacent Native Colonies.**]—*Taiwan Igakkai Zassi* (*Jl. Med. Assoc. Formosa*). 1940. Mar. Vol. 39. No. 3. [In Japanese pp. 315–341. [29 refs.] German summary pp. 342–350.]

Reference is made to the work abstracted above, in which 97 cases were reported during 1938. In 1939 there were found 125 further cases, of which 64 were of florid yaws. In a number of these there was definite relapse in spite of full salvarsan treatment. The previous medical histories of 86 were followed up and many during the last 10 years had undergone specific therapy, sometimes to the extent of five courses of treatment. Most had been intensively treated in the autumn of 1938 or the spring of 1939, yet in the summer of 1939 relapse was seen in 21.

It is commonly known that although the eruption of yaws is usually cleared by a single injection of a salvarsan preparation, it is difficult to convert a positive to a negative Wassermann reaction. In the summer of 1939 the Wassermann reactions of 94 patients were:—strongly positive 43 (of whom 20 had florid yaws), positive 19 (4 florid), weakly positive 10, negative 22. There was no relationship between the intensity of treatment and the development of the Wassermann reaction and it is not understood why so many remained positive after full treatment and why so many should undergo relapse. Further work on these points is necessary. The relapses took the form of clavus, psoriasis, condyloma and papilloma. Tables are given which show the distribution of these according to the results of the Wassermann reaction. *C. W.*

Sinha (G. N.). **Yaws in Chatra Subdivision of Hazaribagh District, Chotanagpur.**—*Indian Med. Gaz.* 1939. Dec. Vol. 74. No. 12. pp. 728–729.

HERMANS (E. H.). Pian de la plante du pied et de la paume de la main. [**Plantar and Palmar Yaws.**]—*Acta Leidensia (Scholae Med. Tropicae)*. 1939. Vol. 14. pp. 111–118. With 10 figs. on 4 plates.

Professor Hermans the author of a work on framboesia tropica in 1928, now returns to the question of yaws affections of the palm of the hand and sole of the foot.

He distinguishes (1) a maculo-papular erythema; (2) papillomata; (3) psoriasiform lesions; (4) keratoses; (5) keratoma sulcatum of the sole, and (6) keratoderma punctatum.

Erythematous macules may appear early, or less often a papular eruption is seen which the author previously included as a psoriasiform type. The papules may not develop further or they may be transformed into ordinary yaws, some may become vesicular. The papillomatous lesion is an ordinary yaw which on the foot owing to the thickening of the skin gives rise to the crab-yaw. Mention is made of a psoriasiform condition of the palms in a white missionary who had previously contracted yaws. Reference is made to the framboesial keratoses as " abnormal lesions " ; their association with a spotty depigmentation is noted. Keratoma sulcatum and keratoderma punctatum are also briefly referred to. [The conditions to which reference is made were all described long ago and are all well known to those familiar with yaws. There is nothing new in this article.] *H. S. S.*

SOETOPO (M.) & GOENAWAN (R.). Leproide uitslagen bij framboesia. [**Leprosy-like Eruptions in Yaws.**]—*Geneesk. Tijdschr. v. Nederl.-Indië*. 1939. Oct. 17. Vol. 79. No. 42. pp. 2639–2650. With 6 figs. on 2 plates. English summary.

" 1. Description of three patients, who in the course of yaws showed leproid infiltrations.

" 2. Physical examination, the histological picture of the skin lesion and the serological tests confirm the clinical suspicion [*i.e.* the condition was due to yaws].

" 3. It is possible that under certain circumstances yaws induces leproid infiltrations.

" 4. The affection has been differentiated from syphilis, leprosy, tuberculosis and deep mycotic diseases.

" 5. In the tropics leprosy is to be considered first in such cases.

" 6. It is often impossible to distinguish syphilis from yaws.

" 7. In cases suspected of mixed infection with tuberculosis, the diagnosis depends on histological examination and cavia [guineapig] test."

OOMEN (H. A. P. C.). Over framboetische afwijkingen van de neusholten. I. Symptomatologie. [**Yaws Lesions of the Nasal Cavities.**]—*Geneesk. Tijdschr. v. Nederl.-Indië*. 1940. Jan. 9. Vol. 80. No. 2. pp. 84–106. With 9 figs. on 3 plates. English summary.

" 1. Framboesia of the nasal cavities is a commonly observed syndrome in the tertiary stage of yaws. It is not infrequently met with, even in older children; in its most active form, however, more often in young adults. In persons above fifty years of age usually no more than defects are to be found, but fresh inflammations are then not so very exceptional. Even without treatment the disease can come to a standstill during the youth of the victim,

" 2. If the nasal process has once set in, it almost invariably leads to serious deformity. Breathing through the nose, swallowing and voice formation are hampered and the face suffers gross lesions. The sense of smell usually remains intact and the general health of the sufferer is strikingly little affected by the nasal process itself.

" 3. Although there are often typical scars to be seen in the neighbourhood of the nose, and the organs of audition and tear forming apparatus are often subjected to secondary changes, the mutilating lesions form a definitely self-contained syndrome which in about 80 per cent. of the cases remains limited to the walls of the nasal and the naso-pharyngeal cavities.

" 4. The affection appears usually bilaterally, but is seldom symmetrically distributed. Equally seldom does it remain limited to a small area in the nose, so that as a rule several foci are found at the same time or following one another.

" 5. The active lesions present the characteristics of very chronic inflammatory processes. Their aspect is variable. Multiple ulcers and ulcerations are found on the turbinates and lesions, rapidly leading to perforation, on the cartilaginous septum. These are accompanied by a more or less foetid rhinorrhoea and small haemorrhages and by the ejection of small sequestra of bone. On the bottom of the nasal cavity, in the nasopharynx, and along the free margin of the soft palate appear more long drawn out infiltrates, with small or larger erosions. Circinate, superficial, dry ulcers are also found on the soft palate and on the posterior wall of the naso- and oropharynx.

" Sporadically the gums of the intermaxillary area are involved in the inflammation. Externally the wings and point of the nose often have a typical purple-red colour, are grossly swollen, desquamating and eroded.

" A strictly localized beginning of the process is only occasionally observed in the form of a granuloma on the turbinates. It appears that any of the above-mentioned inflammatory affections may start the process off.

" 6. These inflammatory processes lead in the course of months or years to striking deformities and defects, mostly of the soft tissues, but also of the cartilage and bone. There arises coarsely meshed, firm scar tissue, which is subject to powerful retraction. Even when there is no deformity visible externally on the nose there may be extensive lesions around the nasal cavities. Large perforations of the anterior septum, obliteration of the inferior turbinates, defects in the hard palate and defects and scars in the nasopharynx are the commonest manifestations.

" 7. As long as the inflammatory process shows any signs of activity it is susceptible to treatment with salvarsan preparations. In general, it is very little resistant to even a few injections. Since we can never know how serious deformities may be caused by any given process, it is just as grave an error of technique to withhold the administration of salvarsan as it would be to leave a broken bone to its own devices.

" 8. The Wassermann reaction was positive (and usually strongly so) in all patients suffering from an active inflammatory process, as were also the clearing and clouding reactions of Meinicke. It would appear that in cases where the process has burned itself out these serum reactions can occasionally become negative."

SINNADURAI (Chellappah). **A Curious Case of Gangosa.**—*Jl. Malaya Branch Brit. Med. Assoc.* 1940. Mar. Vol. 3. No. 4. pp. 419–421. With 2 figs.

Gangosa is now rarely seen owing to the therapeutic advances of the last 30 years. The patient here described is a man of about 32, living on the island of Langkawi. He was normal up to the age of 12, when he developed a lesion inside the nose which gave rise to a foul, discharging, indolent ulcer which slowly extended in all directions.

During eight years the process spread, resulting in the present condition in which there is an irregular facial pit bounded below by the dorsum of the tongue, above by the remnants of the ethmoid, and on both sides by the exposed maxillary sinuses and the posterior fragments of the upper jaw. The soft palate, uvula and fauces are intact but the whole of the nose and the front portion of the maxilla have gone. Swallowing is somewhat difficult but there is no regurgitation of food ; phonation is not quite clear but he can enjoy a cigarette.

The patient absolutely denies having had secondary yaws and received only herbal treatment for the gangosa. He is free from leprosy, tuberculosis, blastomycosis, dermal leishmaniasis and the late signs of syphilis. No record of the Wassermann reaction is given. While acknowledging that gangosa is always found in areas where yaws is endemic, the author quotes SIMPSON in the Cameroons who suspects that some other factor plays a part in the aetiology of the condition. It is possible, however, that this patient has had yaws but that the granulomata were so few as to pass unnoticed [see also this *Bulletin*, 1940, Vol. 37, p. 21]. *C. W.*

D'IGNAZIO (Camillo) & DEL CAMPO (Giovanni). Contributo alla eziopatogenesi della gangosa. [**On the Pathogeny of Gangosa.**]—*Arch. Ital. Sci. Med. Colon. e Parassit.* 1939. Dec. Vol. 20. No. 12. pp. 663–672. With 5 figs.

The authors describe, with much detail, the case of a woman of 24 years, who had been married at the age of 13 and separated from her husband a year later. At the age of 15 she suffered from a nodular, pruriginous eruption of one pinna which ulcerated and during the next two years extended to the eye. After suffering from this for five years she had it treated by cautery and it healed. About one year ago, that is three years later, she developed an itching nodule at the base of the nasal septum which soon ulcerated and spread to the upper lip and also deeply towards the soft palate and pharynx—a typical gangosa. Organisms present were *Sp. refringens*, *B. fusiformis*, and a spirochaete like *S. pallida*. The Wassermann reaction was strongly positive with serum, negative with spinal fluid. The authors discuss the diagnosis of blastomycosis, leishmaniasis and gangosa and conclude that the last was the correct one in this case. *H. H. S.*

HOFFMANN (Erich). Gemeinsame amerikanische Herkunft der tropischen Framboesie und Syphilis auf Grund neuer Forschungsergebnisse und Knochenfunde. [**The Bearing of Recent Research and Bone Findings on the Common Origin of Yaws and Syphilis from America.**]—*Muench. Med. Woch.* 1939. Oct. 13. Vol. 86. No. 41. pp. 1512–1515. [Refs. in footnotes.]

NAVARRO (R. J.) & GOMEZ (F.). **A Simple Serologic Test for Yaws and Syphilis suitable for Provincial Hospitals and Field Dispensaries. A Comparison with the Kahn and Wassermann Tests in over 5,000 Cases.**—*Jl. Philippine Islands Med. Assoc.* 1939. Oct. Vol. 19. No. 10. pp. 607–610. [Summary appears also in *Bulletin of Hygiene.*]

The authors detail a serological test for syphilis and yaws first described by CASILLI in 1936 [see *Bulletin of Hygiene* 1937, Vol. 12,

p. 39]. They have carried out tests on 5,390 samples controlled by Kahn and Wassermann reactions. With the first there was a 1·63 per cent. disagreement; with the Wassermann reaction a 4·34 per cent. disagreement. The test as described is as follows:—

"The ordinary Kahn antigen and ordinary normal salt solution are the only reagents needed. The titer of the Kahn antigen must be known just as in the use of the antigen in the Kahn test. One cubic centimeter of antigen mixed with its corresponding amount of salt solution is usually sufficient for ten to fifteen tests.

"The amounts of antigen and salt solution needed for the test are placed separately in small tubes. They are then mixed just as in the Kahn test, and the mixture is poured back and forth six to eight times. The mixture is allowed to stand for ten minutes before it is centrifuged at a speed of around 1,500 revolutions per minute for another period of ten minutes. The clear supernatant fluid is carefully decanted, leaving a thick, yellowish white mush at the bottom of the tube. The inner wall of the tube is dried by inserting cotton or filter paper into the tube down to but not touching the mush. This prevents the mush from becoming watery and preserves its thick mushy consistency. An ordinary slide may be divided into two equal areas by a perpendicular glass pencil mark running across the middle of the slide. The left-hand area is marked (C++) at the upper portion and the right-hand area is marked (C−). This slide is for control sera, both positive and negative. Two or three drops of a known positive serum that has been inactivated at 56°C. for 30 minutes are placed on the left half of the slide and an equal number of drops of a known negative serum are placed on the right half of the slide. A small amount of mush, an amount carried by a two millimetre area of the flat tip of an ordinary "Ideal" toothpick, is mixed with the positive serum and thoroughly emulsified in the serum with the aid of the same toothpick. A similar amount is mixed with and emulsified in the negative serum, using another toothpick. Irregular clumps or aggregates are formed in the positive serum in three to five minutes while the negative serum mixture remains homogeneous. Similar preparations for unknown sera are then made, placing two sera on a slide, one in each area. Sera to be tested must be cleared by centrifuging and inactivated at 56°C. for 30 minutes. Slight or even moderate hemolysis does not interfere with the test. Strongly positive sera will show changes immediately, with large clumps or large aggregates forming even while the mush is being emulsified. Weaker sera will show a delay in the formation of the clumps or aggregates and these are usually smaller or finer. Very weakly positive sera will show the change only after a certain time has elapsed (5–7 minutes) and the clumps may be very fine. In the latter reactions a concave mirror similar to that of the microscope mirror is very helpful in determining the presence of aggregate or clump formations. It is thus seen that the reaction is semi-quantitative, its strength being determined not only by the size of the aggregates but also by the time of their appearance. It is a wise policy to recheck the results after 10 minutes, as weakly positive sera may show clumps only after this time has elapsed. Usually clumps or aggregates developing after this period are small and very fine; occasionally, however, coarse aggregates or big clumps develop as late as 10 minutes. Retaining the old designation of four plus, three plus, two plus, and one plus for positives, it is recommended that sera showing big clumps or aggregates immediately after emulsification be designated four plus; those showing a delayed formation of clumps, even if large ones, or those with smaller clumps developing immediately, may be designated three plus; small clumps with delayed formation may be designated two plus and those very fine clumps developing very late may be called one plus. Suspicious aggregates may be designated (±) and those remaining homogeneous after 20 minutes, may be called negative." *H. S. S.*

FOLEY (E. J.). **Syphilitic Infection of the Central Nervous System in Patients of the Dodoma Mental Hospital (Tanganyika).**—*East African Med. Jl.* 1940. May. Vol. 17. No. 2. p. 81.

Of 68 cerebrospinal fluids taken as a routine from these patients [the majority of whom were presumably African natives], 23 gave positive Wassermann reactions. Almost all patients with strong reactions showed increase in protein, wasting, tongue tremors and dementia. Two showed considerable improvement after receiving tryparsamide. The knee and ankle jerks of some patients were sluggish or absent, and pupillary changes were observed. *C. W.*

HOFF (Hans) & SHABY (J. A.). **Nervous Manifestations of Bejel.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1940. Mar. 20. Vol. 33. No. 5. pp. 549–551. [Summary appears also in *Bulletin of Hygiene.*]

There is a general consensus among writers on Bejel that nervous manifestations are rare, but the authors maintain that this is erroneous if it is conceded that bejel is endemic syphilis not linked with sex. They describe three cases of different interest among Bedouin Arabs giving a history of bejel.

The first is that of a man of 50 years who had suffered for 6 months from headache, giddiness, vomiting, and falling on attempting to walk. There was paralysis of the right side of the face peripheral in type and loss of the right corneal reflex; also right-sided tremor and ataxia. The Wassermann reaction was positive both with serum and spinal fluid. A diagnosis of gumma of the right cerebello-pontine angle was made.

The second was a woman of 28 years with a history of progressive weakness in arms and legs and difficulty in speaking and swallowing. There was symmetrical atrophy of the tongue muscles, speech nasal and bulbar, paralysis of the soft palate and regurgitation of food through the nose. There was spastic paraplegia with increased reflexes and an extensor plantar response, but no sensory disturbance. W.R. positive with serum, negative with spinal fluid. A diagnosis was made of gumma of the pons.

The third was a girl of 18 years complaining of sudden loss of power in the legs. There was complete flaccid paraplegia, but no disturbance of sensation or involvement of cranial nerves. After 8 days the flaccidity gave place to spasticity and exaggerated reflexes and slight dulling of sensation up to the level of distribution of the 10th dorsal. W.R. positive with serum, negative with c.s.f. All three patients made a good recovery on being given anti-syphilitic treatment. The authors conclude :—

"We see many cases of meningovascular syphilis among Bedouin Arabs, and if we are to call their type of syphilitic infection bejel, then we must state that manifestations of meningovascular involvement due to this form of syphilis are quite common."

[See also this *Bulletin*, 1935, Vol. 32, p. 891; 1936, Vol. 33, p. 966; 1937, Vol. 34, p. 965, and *Bull. of Hyg.* 1929, Vol. 4, p. 232; 1933, Vol. 8, p. 417; 1936, Vol. 11, p. 908; 1937, Vol. 12, pp. 117, 773; 1938, Vol. 13, p. 294; 1939, Vol. 14, pp. 222, 407.] *H. H. S.*

MONACELLI (Mario) & PISANI (Domenico). Pseudosclerosi laterale amiotrofica familiare associata a nodosità juxta-articolare. [**Symptoms of Amyotrophic Lateral Sclerosis Associated with Juxta-Articular Nodules.**]—*Settimana Med.* Palermo (formerly *Riv. Sanitaria Siciliana*). 1940. Feb. 16. Vol. 28. No. 7. pp. 161–2, 165–8, 171–4, 177–8. With 5 figs. on 2 plates.

After alluding to the association of certain skin lesions with various neuropsychopathies, commonly of hereditary and familial type, Professors Monacelli and Pisani of the University of Messina describe in detail the cases of three brothers, aged 13 and 9 years and 22 months respectively, each of whom presented the picture of amyotrophic lateral sclerosis associated with juxta-articular nodules. They were the first, third and sixth born in a family of six children, of whom the second died at the age of nine months from nephritis ; the fourth and fifth were healthy.

In case (*a*) the first nodule was noticed on the hand at the age of four years, soon after an attack of nephritis and shortly before the onset of muscular wasting. Nodes appeared in the neighbourhood of the left wrist, on the dorsal aspect of the proximal and distal interphalangeal joints of the little finger of each hand, at the line of the tibio-tarsal joint, the metatarso-phalangeal joint of the big toe, etc.

In case (*b*) there was a history of nephritis at the age of five years followed soon after by wasting of muscles and the appearance of nodules on the feet. When the child came under observation nodes were present in the neighbourhood of the olecranon process of each arm, the metacarpo-phalangeal joints of the second and third fingers, the interphalangeal joints of the second, third and fourth fingers, the external malleoli and the tarso-metatarsal joints of the right first toe and left second toe.

In the third case (*c*), the twenty-two months old child, the first nodules appeared at eight months followed in a few months by the symptoms of the nervous disease, the neighbourhood of the interphalangeal joints of both upper and lower extremities being again the site of the swellings.

All the nodules were rounded in contour, about the size of a small nut, firm in consistency and partly movable. They are well shown in the published photographs. The differential diagnosis of subcutaneous nodules is then discussed at some length and the authors reach the conclusion that the nodes in their three cases show all the characters of juxta-articular nodules (Jeanselme and Lutz), further borne out by the histological findings on biopsy. The literature upon cases of non-framboesial J.A.N. is next reviewed and the evidence for believing their own cases to have a syphilitic aetiology is discussed. Patient (*a*) showed a positive Meinicke reaction and had suffered from a nephritis of unspecified nature : patient (*b*) also had nephritis but was serologically negative : in case (*c*) there was no history of nephritis and the serum reactions were negative. One of the children manifested a sclerohypertrophic glossitis, commonly recognized as a sign of hereditary syphilis.

The father, aged 36, denied syphilis and other venereal disease ; the mother aged 33 manifested no clinical signs of the disease and there was no history of miscarriages but she showed a weakly positive W.R. on reactivation.

In the presence of these signs it is of interest to note that the grandmother had died at the age of 30 of a meningitis which, the authors suggest, was gummatous.

A long discussion is next given detailing the views of neurologists upon the probable syphilitic aetiology of amyotrophic lateral sclerosis.

In conclusion the authors are of the opinion that in their three cases both the neuropathy and the J.A.N. are manifestations of hereditary syphilis in the second generation. [It is a little disappointing perhaps in this otherwise very interesting article to find no reference to the effects of anti-syphilitic treatment.] *H. S. S.*

REVIEWS AND NOTICES.

HERMS (William Brodbeck) [Sc.D.] & GRAY (Harold Farnsworth) [Gr.P.H.] **Mosquito Control. Practical Methods for Abatement of Disease Vectors and Pests.**—pp. xii+317. With 60 figs. 1940. New York: The Commonwealth Fund. London: Humphrey Milford. Oxford University Press. [19*s.* 6*d.*]

This is a practical handbook on mosquito abatement designed primarily for the use of men engaged on such work. Throughout its pages there is evidence that it is the result of a large practical experience in the United States. It is not primarily concerned with the control of malaria and other mosquito-borne diseases: in the absence of such diseases mosquitoes may be the cause of serious nuisance and economic loss. The authors consider that in urban areas in the temperate zone the elimination of mosquito production is the fundamental requisite of mosquito abatement. If disease prevention be the primary object species sanitation must receive first attention. It is rightly emphasized that however small the project an adequate preliminary survey is essential to success and to economy. The chapter dealing with laws and agencies for mosquito abatement is confined to conditions pertaining in the United States. Stress is laid on the importance of public education to success in mosquito abatement. The chapters dealing with the drainage and reclamation of fresh-water and of salt-water marshes are well done, as are those dealing with oils and other larvicides and the methods of application. The last chapter which is concerned with species sanitation and naturalistic control consists of but eleven pages: workers in tropical countries whose main concern is malaria-prevention will regret that more space had not been devoted to these important aspects of mosquito abatement. All engaged in war against the mosquito pest will, however, find much of interest and much valuable information in the pages of this book. An appendix contains a list of the principal malaria-transmitting anophelines of the world with notes concerning their typical breeding places and the regions in which they are important vectors. *Norman White.*

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Gold Coast
Hong Kong.
Iraq.
Jamaica.
Kenya.
Leeward Islands.
Mauritius.
Nigeria.
Northern Rhodesia.
Palestine.
Sarawak.
Sierra Leone.
Straits Settlements.
Tanganyika Territory.
Trinidad.
Uganda.
Unfederated Malay States.
(Johore, Kelantan, Kedah and Perlis, Trengganu).
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